

C0. Introduction

C0.1

**(C0.1) Give a general description and introduction to your organization.**

TransAlta Corporation owns, operates, and develops a diverse fleet of power generation assets in Canada, the United States, and Australia, with a focus on a transition to clean energy and long-term shareholder value. We provide municipalities, medium, and large industries, businesses, and utility customers with clean, affordable, and reliable power. Our mix of power is highly diversified and includes wind, hydro, solar, gas, and coal. We will complete our coal transition in Canada by the end of 2021 with one remaining US coal unit operating to the end of 2025 per an agreement with the State of Washington. At the same time, we continue growing lower carbon power generation solutions, such as renewable energy and battery storage. Since 2005 we have reduced 25 million tonnes of annual GHG emissions (scope 1 and scope 2) or 61 per cent of our 2005 total. On a percentage basis, we have already achieved emissions reductions beyond the national 2030 targets in our operating jurisdictions and we anticipate further reductions before the end of the decade. For over 100 years, TransAlta has been a responsible operator and a proud member of the communities where our employees work and live. TransAlta aligns 15 of its external sustainability goals and targets with goals and targets of the [UN Sustainable Development Goals](#) and two of its external sustainability goals and targets with the Future-Fit Business Benchmark. We are also proud to have achieved the [Bronze level PAR \(Progressive Aboriginal Relations\)](#) designation through the Canadian Council for Aboriginal Business.

C0.2

**(C0.2) State the start and end date of the year for which you are reporting data.**

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Reporting year	January 1 2020	December 31 2020	Yes	2 years

C0.3

**(C0.3) Select the countries/areas for which you will be supplying data.**

- Australia
- Canada
- United States of America

C0.4

**(C0.4) Select the currency used for all financial information disclosed throughout your response.**

- CAD

C0.5

**(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.**

- Operational control

C-EU0.7

**(C-EU0.7) Which part of the electric utilities value chain does your organization operate in? Select all that apply.**

**Row 1**

**Electric utilities value chain**

- Electricity generation

**Other divisions**

- Battery storage
- Coal mining

C1. Governance

C1.1

**(C1.1) Is there board-level oversight of climate-related issues within your organization?**

Yes

C1.1a

**(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.**

Position of individual(s)	Please explain
Chief Executive Officer (CEO)	Climate-related issues are material to our business, especially the impact from climate policy. Hence, issues are addressed directly at our executive level with oversight from our Board, specifically from the Governance, Safety and Sustainability Committee (GSSC) of the Board and Audit, Finance and Risk Committee (AFRC) of the Board. One of our major strategic goals is to be coal-free in Canada by the end of 2021 with the remaining US unit retiring by 2025. We will have retired 82% of our existing coal fleet by 2021 and will retire the remaining 18% by 2025, which involves coal retirements and the conversion of coal facilities to gas, while continuing to operate and grow our low carbon portfolio of wind, solar, hydro, and energy storage. Executive and Board engagement, management, and oversight is crucial to this transition.

C1.1b

**(C1.1b) Provide further details on the board's oversight of climate-related issues.**

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Scope of board-level oversight	Please explain
Scheduled – all meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding annual budgets Reviewing and guiding business plans Setting performance objectives Monitoring implementation and performance of objectives Overseeing major capital expenditures, acquisitions and divestitures Monitoring and overseeing progress against goals and targets for addressing climate-related issues	<Not Applicable>	Our Governance, Safety and Sustainability Committee (GSSC) has oversight of climate change related issues as is noted in the GSSC Charter. This committee meets on a quarterly basis. To reference the GSSC Charter, one of the mandates is: "monitoring and assessing climate change risks and compliance with associated legislation and public reporting". Also with regard to environment and sustainability matters the GSSC is required to: "at least annually, review guidelines and practices relating to environmental protection, including the mitigation of pollution and climate change; (b) consider whether TransAlta's policies and practices relating to the environment are being effectively implemented, and discuss and advise regarding the development of policies and practices regarding climate change, greenhouse gas and other pollutants". There is cross-functionality across our Board and risks are reviewed through our Audit, Finance and Risk Committee (AFRC) and many of our projects, including clean energy projects, are reviewed by other committees of the Board. Hence, from an associated standpoint, climate change related capital expenditures, acquisitions, budgets etc. are reviewed at the Board level on a case-by-case basis. For example, the conversion of coal plants to gas plants is reviewed and requires approval of the full Board. Notably, five of our Board members have identified Environment / Climate Change as being among their top four relevant competencies. We have noted this in our skills matrix section of our 2021 Proxy Circular on page 36.

C1.2

**(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.**

Name of the position(s) and/or committee(s)	Reporting line	Responsibility	Coverage of responsibility	Frequency of reporting to the board on climate-related issues
Chief Executive Officer (CEO)	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	Quarterly

## C1.2a

**(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).**

Climate change risks are monitored and actively managed through our TransAlta-wide risk management processes. Climate change risks and opportunities are identified at the Board level, executive and management level, business unit level (coal, gas, wind, solar, and hydro) and through our corporate function (e.g., government relations, regulatory, emissions trading, sustainability, commercial, customer relations, and investor relations). The business units and corporate functions work closely together and provide information on risks and opportunities to management, the executive team, and the Board. In addition, management and executive have full support from corporate functions and the business unit level to understand risks and opportunities they have identified. Risks and opportunities are reviewed by our management team quarterly and reported to our Governance, Safety and Sustainability Committee of the Board and Audit, Finance and Risk Committee of the Board.

One area that is constantly monitored is climate policy, including the impacts on cost, growth, and compliance. Climate change risks at the asset or business unit level are identified through our Environmental Management Systems, asset management function and systems, our energy and trading business, active monitoring, active participation/communication with stakeholders, liaison with our corporate function, active participation in working groups and more. All identified material risks are added to our Enterprise Risk Management risk register. These risks are assessed and scored based on likelihood and impact (what could have "substantive financial impact," "strategic impact," "stakeholder or reputational impact" or "environment, health and safety impact"). Risks are not considered in isolation. Major risks are the focus of management response and mitigation plans.

## C1.3

**(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?**

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	

## C1.3a

**(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).**

Entitled to incentive	Type of incentive	Activity incentivized	Comment
Corporate executive team	Monetary reward	Emissions reduction project Efficiency project Other (please specify) (Growth in renewable energy)	Our corporate executive annual incentive plans (short-term incentive or annual bonus and long-term share incentives) are tied to TransAlta's performance (i.e., 'pay for performance'). These incentives are tied to execution of strategic goals. Our compensation philosophy is designed to drive the right actions to achieve our strategic goals. The long-term incentive plan for the period 2017 to 2020 included a strategic goal to 'Transition to Clean Energy'. This goal was measured against the performance of the Company, which included: advancing and executing our coal-to-gas conversions (that result in significant GHG reductions); deliver growth in our renewables fleet (zero or very low carbon assets); expand our presence in the US renewables market (zero or very low carbon assets); advance and grow our on-site generation and cogeneration business (decentralized and low carbon / high energy efficiency assets); and continue to improve our already strong financial position and remain disciplined with our capital investment strategy. As such, our incentive program is tied with reducing GHG emissions and climate change management. A significant component of our executive compensation is tied to achieving our strategic goals, which includes growing renewable energy, reducing GHG emissions through our coal-to-gas transition and supporting our customer sustainability goals to decarbonize through on-site low carbon generation. Further details and highlights of our 'Transition to Clean Energy' metric can be found on page 87 of our 2021 Management Proxy Circular.
All employees	Monetary reward	Emissions reduction project Efficiency project Other (please specify) (Growth in renewable energy)	As with the noted executive compensation above, our employees are also incentivized with an annual bonus and certain employees are also granted long-term incentive share units. Unlike the annual incentive compensation for TransAlta's executive team, which measures their performance exclusively on corporate performance, the annual incentive targets for employees are measured against applicable business unit goals, which includes growth in renewables. As a result, a significant component of an employee's compensation can be tied to achieving our strategic goals, which includes growing renewable energy, reducing GHG emissions from our coal-to-gas transition, and supporting our customer sustainability goals to decarbonize through on-site low carbon generation.

## C2. Risks and opportunities

### C2.1

**(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?**  
Yes

### C2.1a

**(C2.1a) How does your organization define short-, medium- and long-term time horizons?**

	From (years)	To (years)	Comment
Short-term	0	3	Our Enterprise Risk Management framework focuses on a 3-year horizon. However, in the risk identification phase leaders are encouraged to think of risk longer term, although risk mitigation plans must have near term actionable steps or monitoring plans.
Medium-term	3	10	Our asset plans and maintenance plans focus on the medium to long-term.
Long-term	10	25	Our asset plans and maintenance plans focus on the medium to long-term. We run full life cycle forecasts on all of our assets.

**C2.1b**

**(C2.1b) How does your organization define substantive financial or strategic impact on your business?**

Anything that could incur a 'substantive financial impact', 'strategic impact', 'stakeholder or reputational impact' or 'environment, health and safety impact' to TransAlta and its operation is considered a risk. Risks fall within certain categories relative to our business and are evaluated on impact and likelihood. Risks that combine impact and likelihood over set thresholds are our top risks.

The Audit, Finance and Risk Committee (AFRC) of the Board provides assistance to the Board in fulfilling its oversight responsibilities with respect to the risk identification and assessment process conducted by our senior management (Management) including the programs established by Management to respond to such risk. Management is responsible for the identification and management of TransAlta's risks and the development and implementation of policies and procedures to mitigate such risks. The AFRC's role is to provide oversight in order to ensure that TransAlta's assets are protected and safeguarded within reasonable business limits. The AFRC reports to the Board on its risk oversight responsibilities.

The Board is responsible for ensuring that TransAlta has adopted processes and key policies for the identification, assessment, and management of its principal risks. The Board has delegated to the AFRC the responsibility for the oversight of Management's identification, and evaluation, of TransAlta's principal risks, and the implementation of appropriate policies, processes, and systems to manage or mitigate the risks within the TransAlta's risk appetite. The AFRC reports to the Board thereon.

Key risks to our business include:

1. Operational risks: Government Policy, Commodity Price, Events, Fuel-Supply, Mining, HR, Legal, Regulatory Reporting & Compliance, Safety, Cyber Security, IT Systems, Procurement, Technology, Volumetric, Environment, Labour, Equipment Plant & Technology, Project, and Transmission
2. Finance risks: Credit, Liquidity, Foreign Exchange, Commodity Trading, Financial Reporting and ESG Compliance, and Interest Rates
3. Growth risk: Prospecting, Permitting, Construction, Customer Self-Supply/Build, Asset Integration, Analysis, and Forecasting
4. Competitive risks: Industry Consolidation, New Generation Technology, New Distribution Technology, Electricity Market Design, Market Rule Changes, Economy, Energy Storage, Litigation, and Tariffs.

These risks comprise normal course of business risks, strategic risks, and tail risk events. These risks form a comprehensive risk register. One of these risks, or a combination, could have a substantive financial impact on our business. Management assesses risk in the context of its strategic objectives. Risks are prioritized based on impact (financial, operational, reputational, health, safety, and environment) and likelihood (situation context). Prioritized risks are reported to the AFRC quarterly. Internal Audit creates an annual audit plan that complements enterprise risk assessments to provide additional assurance to the Board on the effectiveness of programs, projects, systems, and controls. Additional financial assurance is provided by TransAlta's SOX program which assesses the design, implementation, and operation effectiveness of key internal controls over financial reporting.

Additional risks: Reputation, Tax, and Legal are reviewed through other oversight processes in the Finance and Commercial groups. Certain functional risk mitigation activity such as Insurance, Human Resources (Compensation), and Environmental Health and Safety audits are also reviewed directly in other Board committees such as the Governance, Safety and Sustainability Committee (GSSC). For example, our GSSC committee is also responsible for "monitoring and assessing climate change risks and compliance with associated legislation and public reporting".

Relevant to climate change we evaluate risk (and opportunity), which could impact both operations and finance. For example, significant negative regulatory changes could affect our business model. If in the future we were not able to obtain permits for our coal-to-gas conversions, it would impact both the environment if we instead operated our coal assets for longer, our ability to generate capital (coal is devalued by the market and a large risk), longer-term cash flows, and a provincial transition to a reliable, affordable, and low-carbon electricity grid.

**C2.2**

## (C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

### Value chain stage(s) covered

Direct operations  
Upstream  
Downstream

### Risk management process

Integrated into multi-disciplinary company-wide risk management process

### Frequency of assessment

More than once a year

### Time horizon(s) covered

Short-term  
Medium-term  
Long-term

### Description of process

TransAlta's strategy is focused on the operation of its existing assets (wind, hydro, solar, gas and coal) and development of renewable energy, storage, and low-carbon natural gas generation. As discussed above, risks are identified and assessed in the context of TransAlta's strategic objectives. Risks are not viewed in isolation. Prioritized risks are subject to mitigation action plans by management and reported to the Audit, Finance and Risk Committee quarterly. Further assurance is provided by Internal Audit and other functional experts such as tax, safety, regulatory, and compliance teams. Climate change risks are monitored through our TransAlta-wide risk management processes and are actively managed. Climate change risks and opportunities are identified at the Board level, executive and management level, business unit level (coal, gas, wind, solar, and hydro), and through our corporate functions (e.g., government relations, regulatory, legal, emissions trading, sustainability, commercial, customer relations, and investor relations). The business unit and corporate functions work closely together and provide information on risks and opportunities to management, the executive team, and the Board. One area that is constantly monitored is climate policy, including the impacts on cost, growth, and compliance. Climate change risks at the asset or business unit level are identified through our Environmental Management Systems, asset management function and systems, our energy and trading business, active monitoring, active participation/communication with stakeholders, liaison with our corporate function, active participation in working groups, government engagement and more. All identified material risks are added to our Enterprise Risk Management risk register. These risks are assessed and scored based on likelihood and impact (what could have 'substantive financial impact', 'strategic impact', 'stakeholder or reputational impact', or 'environment, health and safety impact'). Risks are not considered in isolation. Major risks are the focus of management response and mitigation plans. Direct Operations Overview TransAlta has taken significant steps over the last several years to reduce its GHG impact and has announced that by the end of 2021 in Canada and by 2025 in the US it will retire coal facilities or transition high GHG emission intensity coal-fired power plants to low emission intensity natural gas-fired power plants, which protects invested capital of our shareholders. We retired one of our two US coal units in 2020. We will have retired 82% of our existing coal fleet by 2021 and will retire the remaining 18% by 2025. TransAlta has continued to invest in, develop, and construct new renewable energy from wind, solar, and battery technology. From 2000 to 2020, we have grown renewables capacity from approximately 900 MW to over 2,500 MW. As discussed below, we completed our first battery storage project in 2020, allowing for storage of wind energy produced in off-peak electricity demand and shifting it to peak demand offsetting generation which would otherwise come from GHG emitting sources. Upstream Overview Our coal-to-gas asset conversion strategy utilizes existing infrastructure, reducing the cost and emissions related to new generation construction and material procurement. Our gas conversions in Alberta will also utilize low carbon gas (Alberta has world-leading plans in place to increasingly capture fugitive methane emissions). Downstream Overview Developing renewable energy projects with corporate power purchase agreements allows for the financing and development of these renewable energy sources and permits corporate and institutional customers to advance renewable energy targets. An example is our Skookumchuck wind facility that we acquired in 2020 which has a 20-year power purchase agreement with Puget Sound Energy, Inc. Our continued construction and development of renewable projects allow utilities and corporate purchasers to meet renewable energy and GHG reduction targets as they consume energy for their customers and create products and services. Our emission credit and offset trading and marketing business allows customers to receive the environmental attributes of renewable energy generation, providing a further revenue stream for these assets and supporting additional renewable energy development. Transition Risk (Market Risk): Case Study Changing customer behaviour, such as reduced demand for electricity (digitization and energy efficiency, less travel, less consumerism and associated electricity use for manufacturing etc.) could impact our business. Hence, this is one risk within our risk register we evaluate on an ongoing basis. All risks are scored on their potential to impact the business. Currently, we believe this case study risk is mitigated by the global trend to increasingly electrify customer products, such as transport, etc. and growing global populations. Our shift to a low-carbon business model supports this type of future and places us as a very essential service in a low carbon world. We do not consider risks in isolation and when considering this transition and market risk, for example, we also evaluate other risk and opportunities in conjunction. Physical Risk (Acute Risks): Case Study The TransAlta South Hedland facility in Western Australia was built with climate adaptation and extreme weather in mind. Extreme weather and climate adaption are both risks considered within our risk register for impact on the business, operations, or facility/office. South Hedland's infrastructure is designed to withstand a category 5 cyclone, which occur in the northwest region of Western Australia and could occur more frequently over the long-term. Category 5 is the highest cyclone rating. Floods, which can occur in the area, have been mitigated by constructing the facility above the normal flood levels. In 2019, a category 4 cyclone hit this facility. Operations were not impacted, and we were able to continue generating electricity through the storm, despite wide-spread flooding and shutdown of the nearby port and associated business activities.

## C2.2a

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**(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?**

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Current environmental and climate specific regulation can and does impact our operations and our business. Both current and emerging regulation is assessed through our Enterprise Risk Management (ERM). The impact of climate related regulations on our business could vary, for example we could experience impacts to cash flow generation, shareholder value, stranded assets and more. In Alberta, for example, carbon pricing (previously Carbon Competitiveness Incentive Regulation (CCIR), now Technology Innovation and Emissions Reduction (TIER) Regulation in 2020) adds significant operating costs to our coal fleet which will be mitigated by ending coal generation in 2021. Our response has been to advocate for and advance coal-to-gas plant conversions in Alberta, which have significant decarbonization benefits for TransAlta and the province, while supporting reliable electricity in the province and a transition to a low-carbon grid. Our Government Relations and Regulatory teams stay closely connected to current regulation in order to stay informed on current challenges and opportunities, while also being prepared for potential changes to regulation. We have experienced significant change to climate related regulations in Canada in the past five years.
Emerging regulation	Relevant, always included	Environmental and climate specific regulation can and does impact our operations and our business. Both current and emerging regulation is assessed through our ERM. Significant carbon market changes, both provincially and federally in Canada, have been both a current and emerging risk in Canada in the last several years. To mitigate these risks TransAlta's market regulation and government relations teams actively engage in official consultation processes, as well as engage political, department, and agency staff. In addition, partnerships are fostered with like-minded industry groups and associations. We continue to advocate for smart policy decisions that achieve emissions reduction, align with our commitment to achieving carbon neutrality and support our business model (focus on clean, affordable, and reliable power for our customers).
Technology	Relevant, always included	Technology could support a low-carbon transition and could impact TransAlta both positively and negatively. Existing and emerging impacts of new and emerging technology is evaluated through our ERM. Examples of technology risk and opportunity include infrastructure changes (shift to distributed energy and away from large-scale power generation infrastructure assets and projects) and digitization combined with greater adoption of energy efficiency (less use of our end product). Cost-competitive battery storage will enable greater adoption of renewables and a greater shift to a distributed power generation model. We recently completed our first battery storage (10 MW) project at one of our wind farms in southern Alberta in 2020. Our teams continuously adopt improved technology for each of our new developments. This helps protect our shareholder value and maintain delivery of reliable and affordable electricity. We know that new technologies will emerge over the next number of years as the industry continues to drive towards lower emissions while maintaining a reliable and affordable product for customers.
Legal	Relevant, always included	The risk and liability associated with climate change, specific to, for example: regulatory compliance, disclosure, mitigation, adaption, failure to adapt operations, or investment decisions are increasingly being evaluated through our ERM process. We are mature in areas such as disclosure and regulatory liability risk. We have noted the trends in increased climate litigation for some time and have mitigated potential risk through alignment of our strategy with decarbonization and we have increased our transparency on climate risks and opportunities over time through disclosure. For example, we have reported to this CDP climate change disclosure request for 10+ years, we have aligned climate disclosure with the Task Force on Climate-related Finance Disclosures (TCFD) recommendations in our annual integrated report for five years, we have established a voluntary GHG reduction target to 2030, and we have established a voluntary carbon neutrality target for 2050.
Market	Relevant, always included	Market risks are extensively evaluated within our ERM. Within the context of climate change, risks are not considered in isolation, rather we evaluate risks in conjunction. For example, when we evaluate the impact on power prices, commodity prices, and contracted power purchase pricing, we consider the impacts of carbon pricing, supply and demand impacts due to pricing, science-based climate change modelling and growth constraints, customer preference shifts to clean energy, etc. We continue to invest in and build renewable power resources to support a low carbon transition. We currently have seven renewable projects that are either underway or recently completed. In December 2020, a 137 MW wind facility located in the state of Washington in which we own a 49 per cent stake was brought into service. Our 10 MW battery storage project in Alberta came online in October 2020. We continue to investigate battery technology as a way to meet customer needs. Our larger renewable fleet makes our overall portfolio more resilient to climate risk, provides increased flexibility in generation and creates incremental environmental value through Renewable Energy Credits or through emission offsets.
Reputation	Relevant, always included	The potential for harming our reputation exists in every business decision and all risks can have an impact on reputation, which in turn can negatively impact our business and securities. Reputational risk cannot be managed in isolation from other forms of risk. Negative impacts from a compromised reputation are evaluated through our ERM and could include revenue loss, reduction in customer base, and decreased value of our securities. We have experienced negative reputational impacts due to our coal operations, including shareholder value erosion. Our transition away from coal by the end of 2021 in Canada and 2025 in the U.S. and growth in our renewables fleet mitigates this risk and supports value creation for shareholders and stakeholders. We will have retired 82% of our existing coal fleet by 2021 and will retire the remaining 18% by 2025.
Acute physical	Relevant, always included	Climate change related acute and chronic physical risks and opportunities are assessed through our ERM with support from business units and subject matter experts. This is a growing area of risk evaluation for TransAlta, which is not to suggest the risk has been neglected, rather that we are increasingly expanding our understanding of climate related acute and chronic risks. We have operating assets in three countries and varied geographic locations, many of which could be impacted by extreme weather events, and these are evaluated through our ERM. Our gas facility at South Hedland, Australia is built with climate adaption in mind. The facility operates with a best-in-class emission intensity for the region and the facility uses less water than traditional gas plants as we use dry cooling towers as opposed to the normal wet cooling towers (wet cooling towers have heavy water consumption). The plant is designed to withstand a category 5 cyclone, which occur in NW Western Australia (and did in early 2019 - we had no downtime associated with a category 4 cyclone). Category 5 is the highest cyclone rating. Floods, which can occur in the area, have been mitigated by construction above the normal flood levels.
Chronic physical	Relevant, always included	Climate change related acute and chronic physical risks and opportunities are assessed through our ERM with support from business units and subject matter experts. This is a growing area of risk evaluation for TransAlta, which is not to suggest the risk has been neglected, rather that we are increasingly expanding our understanding of climate-related acute and chronic risks. We have operating assets in three countries and varied geographic locations, many of which could be impacted by extreme weather events and in some cases long-term changes to climate and weather patterns. Examples of longer-term climate change chronic physical impacts evaluated include the impacts of weather on our hydro and wind businesses. Changes to water flow or wind patterns could impact power production in the future and associated revenue generation.

**C2.3**

**(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?**

Yes

**C2.3a**

**(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.**

**Identifier**

Risk 1

**Where in the value chain does the risk driver occur?**

Direct operations

**Risk type & Primary climate-related risk driver**

Current regulation	Carbon pricing mechanisms
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**Primary potential financial impact**

Increased direct costs

**Climate risk type mapped to traditional financial services industry risk classification**

<Not Applicable>

**Company-specific description**

Our Alberta coal fleet has experienced significant increases in operating costs due to carbon pricing increases from \$15 per tonne in 2016 to \$30 per tonne in 2020. In addition, many of our Power Purchase Arrangements (PPA) at our Alberta coal facility have expired, exposing TransAlta to carbon costs that were previously flowed

through to the customer. We will continue to expose ourselves to increased carbon compliance costs through the interim operation of coal and the expiration of PPAs.

**Time horizon**

Short-term

**Likelihood**

Virtually certain

**Magnitude of impact**

High

**Are you able to provide a potential financial impact figure?**

Yes, an estimated range

**Potential financial impact figure (currency)**

<Not Applicable>

**Potential financial impact figure – minimum (currency)**

180000000

**Potential financial impact figure – maximum (currency)**

301000000

**Explanation of financial impact figure**

Carbon costs in Alberta are \$30/tonne CO<sub>2</sub>e and are expected to rise to \$40 in 2021 and \$50 in 2022 as per Federal rules. At a \$30 carbon price with a performance standard of 0.37 tonnes CO<sub>2</sub>e per MWh our coal related annual GHG emission costs would be approximately \$180 million (takes the difference between the facility emission intensity and the performance standard, multiplied by the carbon price), rising to \$241 million with a \$40 per tonne carbon price and \$301 million with a \$50 per tonne carbon price. This assumes the plants continue to operate as they were operating in 2020 - comparable MWh's and on coal, not natural gas.

**Cost of response to risk**

1000000000

**Description of response and explanation of cost calculation**

We announced our \$2 billion Clean Energy Investment Plan on September 16, 2019. This includes over \$1 billion in allocated capital expenditures for coal to gas conversions (boiler conversions and facility repowering). Associated GHG emission costs per MWh on a converted coal facility (simple boiler conversion, not a repowering of the site) is approximately \$8 per MWh versus approximately \$30 MWh on coal. Conversion of coal units to natural gas is both economic, significantly lowers GHG emissions (and associated cost of carbon) and air pollutants, while supporting the grid in Alberta as it transitions to more renewable energy. We will transition away from coal by the end of 2021 in Canada and 2025 in the US. We will have retired 82% of our existing coal fleet by 2021 and will retire the remaining 18% by 2025.

**Comment**

No further information.

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**Identifier**

Risk 2

**Where in the value chain does the risk driver occur?**

Direct operations

**Risk type & Primary climate-related risk driver**

Market	Changing customer behavior
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**Primary potential financial impact**

Decreased asset value or asset useful life leading to write-offs, asset impairment or early retirement of existing assets

**Climate risk type mapped to traditional financial services industry risk classification**

<Not Applicable>

**Company-specific description**

Our customers are increasingly seeking green solutions, which could impact the future of our natural gas operations

**Time horizon**

Long-term

**Likelihood**

Likely

**Magnitude of impact**

Medium-high

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

659000000

**Potential financial impact figure – minimum (currency)**

<Not Applicable>

**Potential financial impact figure – maximum (currency)**

<Not Applicable>

**Explanation of financial impact figure**

This is a long-term risk and challenging to evaluate the impact. The number above is the carrying amount asset value of our natural gas fleet. We see natural gas as a critical part of a low carbon transition in markets where we operate, such as Alberta, or in locations where we provide on-site power generation for customers.

**Cost of response to risk**

16000000

**Description of response and explanation of cost calculation**

Our sustaining and productivity capital for our gas facilities in 2020 was \$16 million. We continue to evaluate solutions to decarbonize gas, which includes evaluation of carbon capture and storage or utilization, hydrogen, and carbon offsets.

**Comment**

In addition, we continue to advance our focus on renewable energy and storage, which supports customers with an ambition for zero-carbon procurement.

**Identifier**

Risk 3

**Where in the value chain does the risk driver occur?**

Downstream

**Risk type & Primary climate-related risk driver**

Acute physical	Increased severity and frequency of extreme weather events such as cyclones and floods
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**Primary potential financial impact**

Decreased revenues due to reduced production capacity

**Climate risk type mapped to traditional financial services industry risk classification**

<Not Applicable>

**Company-specific description**

All facilities are exposed to weather and the possibility of extreme weather events, which could impact our operations and our ability to deliver power to our customers. Increasing severity of extreme weather events could pose an increased risk. If plants do not meet availability or production targets specified in their PPA or other long-term contracts, we may be required to compensate the purchaser for the loss in the availability of production or record reduced energy or capacity payments. For merchant facilities, an outage can result in lost merchant opportunities. Therefore, an extended outage could have a material adverse effect on our business, financial condition, results of operations, or our cash flows.

**Time horizon**

Long-term

**Likelihood**

About as likely as not

**Magnitude of impact**

Medium-high

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

8000000

**Potential financial impact figure – minimum (currency)**

<Not Applicable>

**Potential financial impact figure – maximum (currency)**

<Not Applicable>

**Explanation of financial impact figure**

A 1 per cent increase or decrease in production (MWh) has an approximate impact on net earnings to TransAlta of (+/-) \$8 million. The analysis is based on business conditions and production volumes in 2020. If plants do not meet availability or production targets specified in their Power Purchase Arrangements or other long-term contracts, we also may be required to compensate the purchaser for the loss in the availability of production or record reduced energy or capacity payments. For merchant facilities, an outage can result in lost merchant opportunities. Therefore, an extended outage could have a material adverse effect on our business, financial condition, results of operations or our cash flows. We cannot estimate this cost. Cost implications to both parties would be evaluated on a case-by-case basis.

**Cost of response to risk**

161000000

**Description of response and explanation of cost calculation**

We manage this risk by:
 

- Actively managing our assets and their condition in order to be proactive in plant maintenance so that our plants are available to produce when required;
- Monitoring water resources throughout Alberta to the best of our ability and optimizing this resource against real-time electricity market opportunities;
- Placing our facilities in locations we believe to have adequate resources to generate electricity to meet the requirements of our contracts. However, we cannot guarantee that these resources will be available when we need them or in the quantities that we require; and
- Diversifying our fuels and geography to mitigate regional or fuel-specific events.

 We continue to build in climate resilience and adaptation where applicable. Our gas facility at South Hedland Power Station is a good example of our management method, which is built with adaptation in mind. The facility operates with a low emission intensity for the region and the facility uses less water than traditional gas plants as we use dry cooling towers as opposed to the normal wet cooling towers (wet cooling towers have heavy water consumption). The plant is designed to withstand a category 5 cyclone. Category 5 is the highest cyclone rating. Cyclones occur in the northwest region of Western Australia. Floods, which can occur in the area, have been mitigated by constructing the facility above the normal flood levels. In early 2019, the region experienced a category 4 cyclone, which shutdown BHP Port Hedland port facilities for four days and interrupted operation of the transmission line between Port/South Hedland and Karratha. Despite the cyclone and associated weather, our facility stayed online and was able to supply power to the port and town for the duration of the event. Costs noted above are our sustaining and productivity capital spend in 2020, which supports the ability of facilities continue to operate effectively and efficiently and meet demand from weather. This total includes routine capital, planned major maintenance, and productivity capital (projects to improve power production efficiency and corporate improvement initiatives).

**Comment****C2.4****(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?**

Yes

**(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.****Identifier**

Opp1

**Where in the value chain does the opportunity occur?**

Downstream

**Opportunity type**

Energy source

**Primary climate-related opportunity driver**

Use of lower-emission sources of energy

**Primary potential financial impact**

Increased revenues resulting from increased production capacity

**Company-specific description**

This opportunity is to expand our renewables fleet. We currently have seven renewable projects that are either underway or recently completed that comprises over 900 MW of new generation. In October 2020, we announced that our 10 MW WindCharger battery storage project began commercial operation in Alberta. It is located behind the fence at the Summerview wind facility and is a first-of-its-kind example of firm, truly green electricity in Canada. It is a test of a future where batteries back up renewable and intermittent renewable energy sources. In December 2020, our 137 MW Skookumchuck wind project in the state of Washington in which we own a 49 per cent stake was brought into service. In addition, we have entered into a 20-year agreement with the Alberta Electric System Operator (AESO) for the 207 MW Windrise wind project in Alberta, Canada, which is scheduled for commercial operation in Q3 2021. This is a direct operations opportunity for TransAlta and an opportunity for our customers, the AESO and our other counterparties.

**Time horizon**

Long-term

**Likelihood**

Virtually certain

**Magnitude of impact**

Medium-high

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

45000000

**Potential financial impact figure – minimum (currency)**

&lt;Not Applicable&gt;

**Potential financial impact figure – maximum (currency)**

&lt;Not Applicable&gt;

**Explanation of financial impact figure**

We expect this growth to create approximately \$45 million of new annual EBITDA for TransAlta and support GHG reduction goals for customers.

**Cost to realize opportunity**

440000000

**Strategy to realize opportunity and explanation of cost calculation**

Renewable energy projects are subject to a number of closing conditions. For example, customary regulatory approvals and the receipt of a favourable regulatory determination in relation to the permitting of the project. We were able to begin commercial operation of our WindCharger project in October 2020 and our Skookumchuck project in December 2020. The Windrise project has an expected commercial operation date in Q3 2021. Total capital costs of the wind projects listed above are estimated at \$440 million (mid-range of costs below). Skookumchuck - \$150-\$160 million Windrise - \$270-\$285 million WindCharger - \$7-8 million

**Comment**

These projects will avoid approximately 350,000 tonnes of annual CO<sub>2</sub>e for our customers.

**Identifier**

Opp2

**Where in the value chain does the opportunity occur?**

Direct operations

**Opportunity type**

Resource efficiency

**Primary climate-related opportunity driver**

Use of more efficient production and distribution processes

**Primary potential financial impact**

Reduced indirect (operating) costs

**Company-specific description**

This opportunity is the conversion of coal plants to natural gas. Our conversion of our coal plants to natural gas in Alberta is a more efficient use of the plants from both an economic and environmental standpoint. In 2020 we completed one unit conversion to natural gas through boiler conversions and are on track to convert two more units and potentially repower one unit as a natural gas combined cycle plant. Two units are still under evaluation. These are being evaluated on their potential for boiler conversions or repowering. Specific to our JV investment in the Sheerness coal facility in Alberta (GHG emissions are captured in our scope 3 emissions in 6.5) this facility will be converted to gas by 2021. We remain committed to our external sustainability goal to be completely off coal in Canada by the end of 2021 and retire our single US unit by the end of 2025. We will have retired 82% of our existing coal fleet by 2021 and will retire the remaining 18% by 2025.

**Time horizon**

Medium-term

**Likelihood**

Very likely

**Magnitude of impact**

Medium-high

**Are you able to provide a potential financial impact figure?**

Yes, an estimated range

**Potential financial impact figure (currency)**

&lt;Not Applicable&gt;

**Potential financial impact figure – minimum (currency)**

180000000

**Potential financial impact figure – maximum (currency)**

301000000

**Explanation of financial impact figure**

Carbon costs in Alberta are \$30/tonne CO<sub>2</sub>e and are expected to rise to \$40 in 2021 and \$50 in 2022 as per Federal rules. At a \$30 per tonne carbon price with a performance standard of 0.37 tonnes CO<sub>2</sub>e per MWh our coal related annual GHG emission costs would be approximately \$180 million (takes the difference between the facility emission intensity and the performance standard, multiplied by the carbon price), rising to \$241 million with a \$40 per tonne carbon price and \$301 million with a \$50 per tonne carbon price. This assumes the plants continue to operate as they were operating in 2020 - comparable MWh's and on coal, not natural gas.

**Cost to realize opportunity**

1000000000

**Strategy to realize opportunity and explanation of cost calculation**

One of our major strategic objectives tied to our Clean Energy Investment Plan is to "successfully execute our coal-to-gas conversions". We plan to invest over \$1.0 billion to convert or repower our Alberta thermal fleet to natural gas. This will repurpose and reposition our fleet to a cleaner gas-fired fleet and advance our leadership position in onsite generation while generating attractive returns by leveraging TransAlta's existing infrastructure. Our Clean Energy Investment Plan includes converting three of our existing Alberta thermal units to gas by 2021 (one of these was converted in 2020) by replacing existing coal burners with natural gas burners and two JV thermal units at the Sheerness coal facility. The Clean Energy Investment Plan also includes the potential repowering of the steam turbines at Sundance Unit 5 and Keephills Unit 1, by installing one or more combustion turbines and heat recovery steam generators, thereby creating highly efficient combined-cycle units. The repowered units are expected to be a 35 per cent lower capital investment when compared to a new combined-cycle facility, while achieving a similar heat rate. The Clean Energy Investment Plan assumes there are no delays in securing the natural gas supply requirements, which may result from regulatory or other constraints. The capital cost of boiler conversions is a range \$120-\$200 million. This assumes a conversion range of 1,260 to 2,340 MW. The current cost estimates on the potential repowering are \$750 - \$770 million per unit and assumes approximately 750 MW. We have several coal units still under evaluation. These are being evaluated on their potential for boiler conversions. We remain committed to our external sustainability goal to be completely off coal in Canada by the end of 2021 and retire our single US unit in 2025. We will have retired 82% of our existing coal fleet by 2021 and will retire the remaining 18% by 2025. The highlights of these gas conversion investments include:

- Positioning TransAlta's fleet as a low-cost generator in the Alberta energy-only market;
- Generating attractive returns by leveraging TransAlta's existing infrastructure;
- Significantly extending the life and cash flows of our Alberta thermal assets; and
- Significantly reducing air emissions and costs.

**Comment**

We continue to advance our coal-to-gas conversion projects. We completed the conversion of Sundance Unit 6 in 2020 and the conversion of Keephills Unit 2 in 2021. We continue to advance conversion of our Keephills Unit 3 in 2021. During the first quarter of 2020, we received regulatory approval from the Alberta Utilities Commission for the repowering of Sundance Unit 5 and Keephills Unit 1 into combined cycle units. We have received Alberta Environment and Parks (AEP) approval for Keephills Unit 1 but are waiting on AEP approval for Sundance Unit 5.

**Identifier**

Opp3

**Where in the value chain does the opportunity occur?**

Downstream

**Opportunity type**

Products and services

**Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

**Primary potential financial impact**

Increased revenues through access to new and emerging markets

**Company-specific description**

This opportunity is the development, marketing, and sale of environmental attributes. Carbon related environmental attributes that we have the ability to generate, trade, purchase and sell, include Alberta Emission Performance Credits (EPCs), Alberta carbon offsets, Renewable Energy Credits (RECs) and emission offsets. Alberta carbon offsets can be voluntarily generated by Alberta projects, which meet Alberta carbon offset system qualification protocols. Our Alberta wind facilities generate Alberta carbon offset credits. RECs are produced from our renewable energy assets (wind, hydro, and solar) and can be traded in voluntary carbon markets or sold to customers. RECs can be used to meet regulatory requirements when a target for renewable energy generation is set by a jurisdiction or can be used to voluntarily 'green' electricity procurement. Emissions offsets are produced from voluntary projects that reduce emissions in sectors of the economy not covered by carbon reduction regulations. The optimization of environmental attributes can be used as a cost-effective way for TransAlta, or our customers, to lower compliance costs attributed to carbon policies or renewable portfolio standards. These attributes can also help achieve voluntary corporate sustainability or carbon reduction goals. In addition, our Emissions Trading team actively looks to buy and sell carbon offsets with the goal to generate revenue from carbon offsets or support our customers' carbon offset goals.

**Time horizon**

Long-term

**Likelihood**

Virtually certain

**Magnitude of impact**

Medium

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

25000000

**Potential financial impact figure – minimum (currency)**

<Not Applicable>

**Potential financial impact figure – maximum (currency)**

<Not Applicable>

**Explanation of financial impact figure**

This figure is revenue in 2020 from environmental attribute sales. This includes the sale of Alberta carbon offsets, renewable energy credits (RECs) and solar renewable energy credits (SRECs) in the US.

**Cost to realize opportunity**

300000

**Strategy to realize opportunity and explanation of cost calculation**

We have people and expertise in place to serialize and register carbon offset credits within different markets. We have an Emission Trading team in place, who actively market our credits, buy and sell carbon offset credits, and seek investment opportunities in carbon offset projects.

**Comment**

Our Emissions Trading team is comprised of two people. Support from the business unit is also required to serialize Alberta carbon offsets credits, EPCs or RECs. Hence the value above accounts for employee time and is an estimate.

**C3. Business Strategy**

**C3.1**

**(C3.1) Have climate-related risks and opportunities influenced your organization's strategy and/or financial planning?**

Yes, and we have developed a low-carbon transition plan

**C3.1a**

**(C3.1a) Is your organization's low-carbon transition plan a scheduled resolution item at Annual General Meetings (AGMs)?**

	Is your low-carbon transition plan a scheduled resolution item at AGMs?	Comment
Row 1	No, and we do not intend it to become a scheduled resolution item within the next two years	TransAlta consistently communicates our corporate strategy to our shareholders, which includes our low-carbon transition plan. It is impractical for TransAlta to take every item of a strategic nature to the shareholders for approval (or reassurance). Rather, like any strategic decision the company makes, the shareholders can voice their support by approving (or withholding votes for) the election of directors (including our CEO).

**C3.2**

**(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?**

Yes, qualitative and quantitative

**C3.2a**

**(C3.2a) Provide details of your organization's use of climate-related scenario analysis.**

Climate-related scenarios and models applied	Details
2DS IEA B2DS IEA Sustainable development scenario	The sectoral decarbonization approach methodology of science-based target setting has informed the climate resiliency of our goal to reduce emissions by 2030 (in respect to prevention of 2 degrees of global warming, now well beyond 2 degrees). Our goal is to reduce 19.7 million tonnes of CO2e by 2030, over a 2015 baseline (in line with Paris Agreement). The year 2030 is aligned with the ambition of Climate Action as per UN SDG goal 13. This scenario and associated target encompass TransAlta-wide scope 1 and scope 2 emissions, as per an operational control boundary as per the GHG Protocol Corporate Accounting and Reporting Standard. Our 2015 baseline is 32,227,815 tonnes CO2e (TransAlta-wide operational control scope 1 and 2 emissions). We anticipate in 2030 annual CO2e scope 1 and scope 2 emissions to be approximately 12,527,815 tonnes CO2e (19.7 million tonne reduction), a 61 per cent reduction over 2015. This scenario, supported by our target, holds our business accountable to reduce GHG emissions across our existing fleet, while advancing low-carbon growth opportunities. Essentially it provides us a carbon budget. The phase-out and conversion of the majority of our coal fleet to gas supports achieving this target. Achieving this target will contribute to meeting a new companywide target that was announced in 2021 to achieve carbon neutrality by 2050. Our actions also support others achieving their carbon reduction goals. As we reduce our scope 1 emissions, grid emission intensities improve as do our customers' scope 2 emissions. Our continued growth in renewable energy also supports our customers' decarbonization goals, especially when projects are additional, such as our recently completed wind development projects in the US (for Microsoft and other partners). We continue to model this target under different scenarios to ensure its relevance.

C3.3

**(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.**

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	We are shifting from providing a GHG-intensive product to a low-carbon product to meet the need to decarbonize and mitigate associated societal risks, but also to meet changing goals from our customers. As noted above we continue to build renewable projects for customers seeking to meet their own sustainability goals, such as carbon neutrality on scope 2 or meeting RE100 goals. We continue to support customers with on-site power generation goals, where collectively there is an opportunity to reduce GHG impacts through on-site cogeneration, where power and steam production replaces existing higher GHG intensive boilers. Our conversion of coal plants to gas will significantly reduce the GHG intensity of the Alberta grid, supporting scope 2 emission reductions for our customers and Alberta commercial and industrial loads. Another way we can contribute to our customers' sustainability goals is through the product use of environmental attributes. Environmental attributes that we have the ability to generate, trade, purchase, and sell, include Alberta environmental performance credits, Alberta carbon offsets, Renewable Energy Credits (RECs), and emission offsets. Alberta carbon offsets can be voluntarily generated by Alberta projects, which meet Alberta carbon offset system qualification protocols. Our Alberta wind facilities generate Alberta carbon offset credits. RECs are produced from our renewable energy assets (wind, hydro, and solar) and can be traded in voluntary carbon markets or sold to customers. RECs can be used to meet regulatory requirements when a target for renewable energy generation is set by a jurisdiction or can be used to voluntarily 'green' electricity procurement. Emissions offsets are produced from voluntary projects that reduce emissions in sectors of the economy not covered by carbon reduction regulations. The optimization of environmental attributes can be used as a cost-effective way, for TransAlta or our customers, to lower compliance costs attributed to carbon policies or renewable portfolio standards. Attributes can also help achieve voluntary corporate sustainability or carbon reduction goals.
Supply chain and/or value chain	Yes	As noted above, our customer base is increasingly integrating ESG risk into their business decisions and as such we see an advantage to continued growth in clean power technologies to support our customer sustainability goals, such as RE100 or net-zero ambitions. Additional projects, such as renewable facilities, and absolute reductions of GHG by TransAlta, support both our customer goals and societal objectives to reduce GHG to levels that will hold warming to well below 2 degrees. In 2019 our Board of Directors approved a Supplier Code of Conduct that applies to all vendors and suppliers of TransAlta. Under this code, suppliers of goods and services to TransAlta are required to adhere to our core values, including as it pertains to health and safety, ethical business conduct and environmental leadership. Climate change management cuts across all three of these values for suppliers. We rolled out a Supplier Relationship and Performance Management program in 2020 with a few of our key and strategic suppliers. The goals of the program include ensuring alignment of our suppliers' goals with those of TransAlta, streamlining communications while providing a platform to discuss how to elevate performance, creating value through access to innovative ideas and working closely with the suppliers on executing activities.
Investment in R&D	Yes	We recognize the need to decarbonize the power sector and as has been noted we are taking strategic steps to support this with increased renewable energy development and conversion of coal to gas. We also recognize the associated problems of renewable energy intermittency. For the last several years we have been working on development of a 'first of its kind' battery storage project in Alberta. In 2020, we started commercial operations of our WindCharger battery storage project, an innovative 10 MW/20 MWh energy storage project that uses Tesla lithium-ion batteries. The project stores energy produced by our nearby Summerview II wind facility and discharges electricity onto the Alberta grid during system supply shortages. This project received co-funding support from Emissions Reduction Alberta. The total cost of the project to TransAlta was between \$7 million and \$8 million. As an electricity generator, we also continually and consistently look for ways to optimize and create efficiencies related to the use of energy. For example, TransAlta has engaged with Pacific Northwest National Laboratory (PNNL) to conduct a feasibility study to assess how storage and hybrid systems can be utilized to help meet the energy needs of the pacific northwest region of the US as it undergoes a significant energy transition to clean energy. In addition, we continue to engage with various developers of long duration energy storage solutions, such as flow batteries. This technology will allow for time shifting energy from week to week and potentially season to season. In 2019, we also supported a study conducted by Stanford University to understand how to improve wind production. The research showed that angling turbines slightly away from the wind can boost energy produced and even out variable supply.
Operations	Yes	The impact of climate related policy intervention (mandatory timelines on coal plant shutdowns) and carbon pricing (currently \$30 per tonne CO2e) has led to our strategy to convert a significant amount of our Alberta coal fleet to natural gas and retire the remaining units. Our goal is to be completely coal-free in Canada by the end of 2021 and retire our single US coal unit by 2025. We will have retired 82% of our existing coal fleet by 2021 and will retire the remaining 18% by 2025. Our Clean Energy Investment Plan, announced September 16, 2019, supports capital allocation and expenditures towards conversion of coal facilities to gas.

C3.4

**(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.**

	Financial planning elements that have been influenced	Description of influence
Row 1	Capital expenditures Capital allocation	Capital allocation and expenditure: Recognizing both risk (need to shift away from GHG intensive coal, associated carbon pricing impacts, societal shifts, and expectations) and opportunity (conversion of coal to gas significantly reduces GHG, while supporting a broader lower carbon transition, and continued growth in renewable energy supports a low carbon future and supports our customers' sustainability goals) we announced our Clean Energy Investment Plan on September 16, 2019. This includes converting existing Alberta coal assets to natural gas and advancing our leadership position in renewable energy with a goal to be coal free in Canada by the end of 2021 and retire our single US coal unit by 2025. We will have retired 82% of our existing coal fleet by 2021 and will retire the remaining 18% by 2025. The total cost of the plan is expected to be approximately \$2 billion which includes approximately \$800 million of renewable energy projects already under construction. The investment time frame associated with this plan will reach to 2024-2025, but it should be noted the majority of projects will be completed sooner.

C3.4a

**(C3.4a) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).**

Discussed in detail above.

C4. Targets and performance

C4.1

**(C4.1) Did you have an emissions target that was active in the reporting year?**

Absolute target

**C4.1a**

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**(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.**

**Target reference number**

Abs 1

**Year target was set**

2015

**Target coverage**

Company-wide

**Scope(s) (or Scope 3 category)**

Scope 1+2 (location-based)

**Base year**

2015

**Covered emissions in base year (metric tons CO2e)**

32227815

**Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)**

100

**Target year**

2021

**Targeted reduction from base year (%)**

22

**Covered emissions in target year (metric tons CO2e) [auto-calculated]**

25137695.7

**Covered emissions in reporting year (metric tons CO2e)**

16379890

**% of target achieved [auto-calculated]**

223.521274176585

**Target status in reporting year**

Achieved

**Is this a science-based target?**

No, but we are reporting another target that is science-based

**Target ambition**

<Not Applicable>

**Please explain (including target coverage)**

Target was achieved ahead of schedule at YE 2018

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**Target reference number**

Abs 2

**Year target was set**

2015

**Target coverage**

Company-wide

**Scope(s) (or Scope 3 category)**

Scope 1+2 (location-based)

**Base year**

2015

**Covered emissions in base year (metric tons CO2e)**

32227815

**Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)**

100

**Target year**

2030

**Targeted reduction from base year (%)**

61.11

**Covered emissions in target year (metric tons CO2e) [auto-calculated]**

12533397.2535

**Covered emissions in reporting year (metric tons CO2e)**

16379890

**% of target achieved [auto-calculated]**

80.4691217785122

**Target status in reporting year**

Underway

**Is this a science-based target?**

Yes, we consider this a science-based target, but it has not been approved by the Science-Based Targets initiative

**Target ambition**

2°C aligned

**Please explain (including target coverage)**

Abs2 is aligned with Goal 13, Climate Action: UN Sustainable Development Goals. Abs2 is also aligned with science-based target setting, specifically using the sectoral decarbonization approach - we completed unofficial validation of this target with SBTi.

**C4.2**

**(C4.2) Did you have any other climate-related targets that were active in the reporting year?**

Other climate-related target(s)

**C4.2b**

**(C4.2b) Provide details of any other climate-related targets, including methane reduction targets.**

**Target reference number**

Oth 1

**Year target was set**

2017

**Target coverage**

Company-wide

**Target type: absolute or intensity**

Absolute

**Target type: category & Metric (target numerator if reporting an intensity target)**

Fossil fuel reduction target	Other, please specify (Installed Coal Capacity (MW))
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**Target denominator (intensity targets only)**

<Not Applicable>

**Base year**

2017

**Figure or percentage in base year**

4653

**Target year**

2026

**Figure or percentage in target year**

0

**Figure or percentage in reporting year**

4006

**% of target achieved [auto-calculated]**

13.9050075220288

**Target status in reporting year**

Underway

**Is this target part of an emissions target?**

This target also builds into our 2030 GHG emission reduction target due to the nature of coal power generation being GHG intensive.

**Is this target part of an overarching initiative?**

Science Based Targets initiative

**Please explain (including target coverage)**

As noted previously, our GHG target is not aligned officially with SBTi, but we continue to model against SBTi and the sectoral decarbonization approach to ensure its relevance. This target is also one of our strategic sustainable development targets, which we announce annually in our Integrated Report. The specific goal can be found on our targets website: <https://www.transalta.com/sustainability/sustainable-development-targets/>

**C4.3**

**(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.**

Yes

**C4.3a**

**(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.**

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	5	2689454
To be implemented*	2	1111792
Implementation commenced*	3	353123
Implemented*	3	117193
Not to be implemented	0	0

**C4.3b**

**(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.**

**Initiative category & Initiative type**

Low-carbon energy consumption	Other, please specify (Battery Storage)
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**Estimated annual CO2e savings (metric tonnes CO2e)**

2099

**Scope(s)**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

0

**Investment required (unit currency – as specified in C0.4)**

7500000

**Payback period**

4-10 years

**Estimated lifetime of the initiative**

6-10 years

**Comment**

This is our WindCharger battery storage project, a 10 MW/20 MWh energy storage project in Alberta that uses Tesla lithium-ion batteries. The project stores energy produced by our nearby Summerview II wind facility and discharges electricity onto the Alberta grid at times of high-peak demand. WindCharger primarily participates in the ancillary services market, and we have put in a proposal to participate the Fast Frequency Response pilot with the Alberta Electric System Operator as well.

**Initiative category & Initiative type**

Low-carbon energy generation	Wind
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**Estimated annual CO2e savings (metric tonnes CO2e)**

17603

**Scope(s)**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

0

**Investment required (unit currency – as specified in C0.4)**

98000000

**Payback period**

4-10 years

**Estimated lifetime of the initiative**

21-30 years

**Comment**

This is our Skookumchuck wind project, a 137 MW project located in the state of Washington, which is contracted with a 20-year PPA with Puget Sound Energy, Inc. and began operation on Nov. 7, 2020.

**Initiative category & Initiative type**

Energy efficiency in production processes	Fuel switch
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**Estimated annual CO2e savings (metric tonnes CO2e)**

97500

**Scope(s)**

Scope 1

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

0

**Investment required (unit currency – as specified in C0.4)**

24000000

**Payback period**

1-3 years

**Estimated lifetime of the initiative**

11-15 years

**Comment**

TransAlta completed the first of three planned coal-to-gas boiler conversions at its Sundance and Keephills power generation facilities near Wabamun, Alberta in February 2021. The conversion was conducted on the Sundance 6 thermal unit during 2020, which caused more downtime than normal. Converting to natural gas from coal reduces our CO2e emissions by half from approximately 1.05 tonnes CO2e per MWh to approximately 0.52 tonnes CO2e per MWh. Historically, we have implemented fuel switching at our facilities through cofiring with gas, but these efficiencies have largely now been optimized and further efficiencies can only be gained through facility conversion.

**C4.3c**

**(C4.3c) What methods do you use to drive investment in emissions reduction activities?**

Method	Comment
Internal price on carbon	We assess internal projects on a case-by-case basis and at a carbon price of \$30 to \$170 tonne CO2e.
Dedicated budget for other emissions reduction activities	We are a leader in renewable energy development, with over 2,500 MW of installed renewable capacity in North America. We continue to seek opportunities to grow renewable energy. As part of our \$1.9 to \$2.1 billion Clean Energy Investment Plan, announced Sept 16, 2019, we have allocated approximately \$440 million of capital to renewable energy projects, which have either recently been completed or are already under construction.
Dedicated budget for other emissions reduction activities	As part of our \$1.9 to \$2.1 billion Clean Energy Investment Plan announced Sept 16, 2019, we have allocated over \$1 billion to convert our Alberta thermal fleet to natural gas. This will repurpose and reposition our fleet to a cleaner gas-fired fleet and advance our leadership position in onsite generation while generating attractive returns by leveraging TransAlta's existing infrastructure.

**C4.5**

**(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?**

Yes

**C4.5a**

**(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.**

**Level of aggregation**

Product

**Description of product/Group of products**

Renewable electricity (hydro, wind, and solar)

**Are these low-carbon product(s) or do they enable avoided emissions?**

Low-carbon product

**Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions**

Other, please specify (Our renewable generation qualifies as carbon offsets or RECs under different offset frameworks; hence these are low-carbon facilities / products. They are very close to 0 emission facilities from a scope 1 and 2 GHG accounting perspective.)

**% revenue from low carbon product(s) in the reporting year**

28

**% of total portfolio value**

<Not Applicable>

**Asset classes/ product types**

<Not Applicable>

**Comment**

In 2020 we earned \$592 million in revenue from renewable energy generation.

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**Level of aggregation**

Group of products

**Description of product/Group of products**

We can contribute to our customers' sustainability goals through the use of environmental attributes. Environmental attributes that we have the ability to generate, trade, purchase, and sell, include Emission Performance Credits (EPCs), Alberta carbon offsets, Renewable Energy Credits (RECs) and emission offsets. Alberta carbon offsets can be voluntarily generated by Alberta projects, which meet Alberta carbon offset system qualification protocols. Our Alberta wind facilities generate Alberta carbon offset credits. RECs are produced from our renewable energy assets (wind, hydro, and solar) and can be traded in voluntary carbon markets or sold to customers. RECs can be used to meet regulatory requirements when a target for renewable energy generation is set by a jurisdiction or can be used to voluntarily 'green' electricity procurement. Emissions offsets are produced from voluntary projects that reduce emissions in sectors of the economy not covered by carbon reduction regulations. The optimization of environmental attributes can be used as a cost-effective way, for TransAlta or our customers, to lower compliance costs attributed to carbon policies or renewable portfolio standards. Attributes can also be utilized to achieve voluntary corporate sustainability or carbon reduction goals.

**Are these low-carbon product(s) or do they enable avoided emissions?**

Low-carbon product and avoided emissions

**Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions**

Other, please specify (EcoLogo, TIER, Alberta Carbon Offset Protocol, Massachusetts SRECs)

**% revenue from low carbon product(s) in the reporting year**

1

**% of total portfolio value**

<Not Applicable>

**Asset classes/ product types**

<Not Applicable>

**Comment**

There is a strict qualification process and retirement / audit process to ensure EcoLogo RECs, EPCs, Solar Renewable Electricity Credits, and carbon offsets are not double sold.

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**C-EU4.6**

**(C-EU4.6) Describe your organization's efforts to reduce methane emissions from your activities.**

Our clean energy investment plan and sustainability goals to reduce GHG, be coal-free by the end of 2025 and grow renewable energy will support GHG reductions, offsetting, and as a result methane or CH4 emission reduction. Operation of renewable energy facilities has close to zero GHG emissions and displaces higher carbon generation. Our Alberta coal-to-gas conversion will reduce GHG emissions from these facilities by close to 60 per cent. Although methane or CH4 specific emissions may increase or hold steady at these facilities, the benefit of the reduced CO2 is substantial. Conversion of our Windsor and Ottawa plants in Ontario to peaking power plant facilities is a good example of TransAlta reducing methane emissions. Our overall methane emissions were 36,159 tonnes CO2e in 2020, which is less than 1 per cent of our total CO2e emissions. The gas supplied to our Alberta coal-to-gas facilities will be some of the lowest carbon natural gas in the world as Alberta and Canada moves forward to meet the federal government's objective of a 45 per cent reduction in vented methane emissions from the oil and gas sector by 2025.

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**C5. Emissions methodology**

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**C5.1**

## **(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).**

### **Scope 1**

**Base year start**

January 1 2015

**Base year end**

December 31 2015

**Base year emissions (metric tons CO2e)**

32041425

**Comment**

Our base year is aligned with the Paris Climate Agreement

### **Scope 2 (location-based)**

**Base year start**

January 1 2015

**Base year end**

December 31 2015

**Base year emissions (metric tons CO2e)**

186390

**Comment**

Our base year is aligned with the Paris Climate Agreement

### **Scope 2 (market-based)**

**Base year start**

January 1 2015

**Base year end**

December 31 2015

**Base year emissions (metric tons CO2e)**

0

**Comment**

Our base year is aligned with the Paris Climate Agreement

## C5.2

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### **(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.**

Australia - National Greenhouse and Energy Reporting Act

Environment Canada, Sulphur hexafluoride (SF6) Emission Estimation and Reporting Protocol for Electric Utilities

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

US EPA Center for Corporate Climate Leadership: Direct Emissions from Stationary Combustion Sources

Other, please specify (Government of Alberta (CCIR/TIER) and Ontario (390/18))

## C5.2a

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### **(C5.2a) Provide details of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.**

Our corporate-wide GHG inventory and calculation of scope 1 and 2 emissions are guided by the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard. Calculations and reporting are carried out using an Operational Control boundary. As per the Kyoto Protocol, GHGs include carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, nitrogen trifluoride, hydrofluorocarbons, and perfluorocarbons. Our exposure is limited to carbon dioxide, methane, nitrous oxide, and a small amount of sulphur hexafluoride. The majority of our estimated GHG emissions are comprised of carbon dioxide emissions from stationary combustion from coal and natural gas power generation. At our business unit or operations level, calculation of emissions defaults to carbon regulations (and associated methodologies) if these are in place and are aligned with an operational control boundary. All protocols or regulations have historically aligned with operational control boundaries, but in 2017 Ontario changed reporting boundaries for our Samia, Ontario gas facility. For this facility, in 2020, we calculate emissions as per O. Reg 390/18 for regulatory purposes but continue to calculate corporate emissions on an Operational Control boundary guided by the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard. Other gas facilities in Ontario are guided by O. Reg. 390/18, which also aligns with an operational control boundary. In Alberta, in 2020, emission calculations for our coal facilities and one gas facility were guided the Technology Innovation and Emissions Reduction Regulation (TIER). Our gas facilities emissions in Australia are calculated in accordance with National Greenhouse and Energy Reporting (NGER). Our coal facility emissions in Washington State are calculated in line with the EPA Greenhouse Gas Reporting Program (GHGRP) or eGGRT. Emissions in 2020 in Alberta and Ontario, under Technology Innovation and Emissions Reduction (TEIR) and O. Reg 390/18 respectively, were verified to reasonable assurance as per regulation. In addition, our entire corporate inventory is verified to a level of limited assurance. In Canada we also report facility GHG emissions through the Greenhouse Gas Reporting Program and SF6 emissions in line with Environment Canada's SF6 Emission Estimation and Reporting Protocol for Electric Utilities.

## C6. Emissions data

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### C6.1

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**(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?**

**Reporting year**

**Gross global Scope 1 emissions (metric tons CO2e)**

16278234

**Start date**

January 1 2020

**End date**

December 31 2020

**Comment**

**Past year 1**

**Gross global Scope 1 emissions (metric tons CO2e)**

20454144

**Start date**

January 1 2019

**End date**

December 31 2019

**Comment**

Minor adjustments were made to historical 2019 GHG emissions data primarily from our wind & solar, hydro, and natural gas business segments as a result of adjusted historical energy use volumes. A minor adjustment was made to 2019 SF6 emissions as a result of an internal discrepancy at our Sarnia facility. An SF6 leak from late in 2019 was not reported in our system until 2020.

**Past year 2**

**Gross global Scope 1 emissions (metric tons CO2e)**

20605142

**Start date**

January 1 2018

**End date**

December 31 2018

**Comment**

Minor adjustments were made to historical 2018 GHG emissions data primarily from our wind & solar, hydro, and natural gas business segments as a result of adjusted historical energy use volumes.

**C6.2**

---

**(C6.2) Describe your organization's approach to reporting Scope 2 emissions.**

**Row 1**

**Scope 2, location-based**

We are reporting a Scope 2, location-based figure

**Scope 2, market-based**

We have operations where we are able to access electricity supplier emission factors or residual emissions factors, but are unable to report a Scope 2, market-based figure

**Comment**

**C6.3**

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**(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?**

**Reporting year**

**Scope 2, location-based**

101656

**Scope 2, market-based (if applicable)**

<Not Applicable>

**Start date**

January 1 2020

**End date**

December 31 2020

**Comment**

**Past year 1**

**Scope 2, location-based**

146972

**Scope 2, market-based (if applicable)**

<Not Applicable>

**Start date**

January 1 2019

**End date**

December 31 2019

**Comment**

Minor adjustments were made to historical 2019 GHG emissions data primarily from our wind & solar, hydro, and natural gas business segments as a result of adjusted historical energy use volumes.

**Past year 2**

**Scope 2, location-based**

175838

**Scope 2, market-based (if applicable)**

<Not Applicable>

**Start date**

January 1 2018

**End date**

December 31 2018

**Comment**

Minor adjustments were made to historical 2018 GHG emissions data primarily from our wind & solar, hydro, and natural gas business segments as a result of adjusted historical energy use volumes.

**C6.4**

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**(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?**

No

**C6.5**

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**(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.**

**Purchased goods and services**

**Evaluation status**

Relevant, calculated

**Metric tonnes CO2e**

181919

**Emissions calculation methodology**

GHG Protocol Quantis Scope 3 Evaluator

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

100

**Please explain**

Our accounting and supply chain group provides our supply chain spend analysis annually for Sustainability to further categorize and add to the Quantis Scope 3 Evaluator. All data comes from the supplier or service provider, but not the specific GHG information.

## Capital goods

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

87540

### Emissions calculation methodology

GHG Protocol Quantis Scope 3 Evaluator

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

### Please explain

Our accounting and supply chain group provides our supply chain spend analysis annually for Sustainability to further categorize and add to the Quantis Scope 3 Evaluator. All data comes from the supplier, but not the specific GHG information.

## Fuel-and-energy-related activities (not included in Scope 1 or 2)

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

408513

### Emissions calculation methodology

Alberta Environment emissions factors for extraction and production of gasoline, diesel, natural gas, propane, and kerosene. Applied emission intensity (mining emissions/coal combustion) from our own coal mine in Alberta to derive coal extraction emissions for our US coal operations.

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

### Please explain

TransAlta purchases natural gas for its gas power generation facilities. Gas extraction and production is included in this calculation. Emissions from coal extraction in AB are accounted for in scope 1, as we operate the mine adjacent to our coal facilities. The extraction of coal combustion at our Centralia plant is also included in this calculation as we rely on coal deliveries at this plant. This calculation also includes diesel extraction and production. Diesel is occasionally used for combustion in our plants. We also use diesel and gasoline for transportation requirements and propane and kerosene for heating. These have also been included.

## Upstream transportation and distribution

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

99120

### Emissions calculation methodology

Diesel usage from locomotives (delivering coal) multiplied by mobile combustion source diesel rail emission factors (taken from Environment Canada National Inventory Report – US Environmental Protection Agency emission factors not clear)

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

### Please explain

Coal is transported in diesel locomotive freight trains from Montana and Wyoming to our Centralia coal power plant in Washington. CO2e is calculated using a guidance from Rail Canada. We track the distance, number of train cars and weight in order to help determine CO2e. Different weights are applied for the return journey, empty cars, hence the weight of the car only. Natural gas is distributed in pipelines. We have tie-in points at all of our operations. Some fugitive emissions are associated with natural gas transportation. We consider these to be negligible. Emissions from extraction and production of natural gas are calculated in 'Fuel and energy related activities'

## Waste generated in operations

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

45436

### Emissions calculation methodology

GHG Protocol Quantis Scope 3 Evaluator

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

### Please explain

As part of our annual sustainability reporting, we track all environmental expenditures, including waste management expenditures. The total was applied in the Scope 3 evaluator to derive an estimate of our waste emissions.

## Business travel

### Evaluation status

Relevant, calculated

### Metric tonnes CO<sub>2</sub>e

121

### Emissions calculation methodology

Travel provider methodology. Sourced from GRASP Reporting. 17. GREEN PORTFOLIO FRAMEWORK ADDITIONAL RESOURCES - GHG FACTORS Common GHG conversion factors for determining GHG emissions performance based on energy use and travel. Air travel - Short haul (under 281 miles): 0.2897 kg CO<sub>2</sub>e/passenger mile / Medium haul (281-994 miles): 0.2028 kg CO<sub>2</sub>e/passenger mile / Long haul (over 994 miles): 0.1770 kg CO<sub>2</sub>e/passenger mile

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

50

### Please explain

Travel provider provided this data and in addition we conservatively double this figure to account for internally booked flights (outside of our travel provider).

## Employee commuting

### Evaluation status

Relevant, calculated

### Metric tonnes CO<sub>2</sub>e

5287

### Emissions calculation methodology

An internal survey was conducted to record the commute of TransAlta employees. The input data included distance travelled, mode of transportation, and US Environmental Protection Agency emission factors for Scope 3 Category 6: Business Travel and Category 7: Employee Commuting. Potential commute changes during summer and winter were accounted for.

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

4

### Please explain

65 employees responded to our internal survey and their data were used as an estimate for our 1,476 employee commutes.

## Upstream leased assets

### Evaluation status

Relevant, calculated

### Metric tonnes CO<sub>2</sub>e

0

### Emissions calculation methodology

TransAlta accounts for emissions from leased assets in its scope 2 emissions, hence this calculation is 0.

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

See comment above.

## Downstream transportation and distribution

### Evaluation status

Relevant, calculated

### Metric tonnes CO<sub>2</sub>e

334

### Emissions calculation methodology

Downstream electricity use, after generation, is transmission and distribution (T&D) of electricity. There are typical losses from T&D. Given our small share of overall power generation these emissions are relatively small. As an example, line losses in Alberta for 2020 were anticipated to be 2.85% [as per guidance from the Alberta Electricity System Operator (AESO)]. Hence, applying this across our fleet (the majority of our infrastructure and generation is in Alberta) and multiplying line losses by our overall generation (conservative as we also provide at the source power for customers) is 24,215,708 MWh x 0.000285 = 690 MWh of electricity lost. Emissions, using a weighted grid emission factor across our fleet is approximately 0.48, would be 334 tonnes. Again, this is a conservative estimate as a significant amount of our electricity is used close to its source.

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

57

### Please explain

As we use Alberta (AESO) line loss public data, we have applied a factor of 57 per cent as this is the amount of generation (MWh) we produced in Alberta in 2020.

## Processing of sold products

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

209393

### Emissions calculation methodology

This is the Scope 3 emissions association with our sold ash products, both fly ash and bottom ash. Lafarge provided us with an estimate for the GHG intensity per tonne of ash for their Scope 1 and 2 emissions. For the emissions associated with transportation, they provided the weight of each shipment along with the kilometres travelled and the type of transportation (rail or truck). For fly ash, specific distances were provided, but for bottom ash, an average distance of 441 km was provided. The metric tonnes of CO2e could then be calculated using emission factors from the US EPA.

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

46

### Please explain

Data was received from Lafarge but was not able to be obtained for our second ash customer, Lehigh Hanson. The intensity given to us by Lafarge was used as an estimate for the intensity of ash for Lehigh Hanson. Lafarge ash accounted for 46% of our total ash sold.

## Use of sold products

### Evaluation status

Not relevant, explanation provided

### Metric tonnes CO2e

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

### Please explain

TransAlta generates electricity. There are no emissions associated with the use of electricity. GHG emissions are calculated in our Scope 1 response.

## End of life treatment of sold products

### Evaluation status

Not relevant, explanation provided

### Metric tonnes CO2e

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

### Please explain

There is no end-of-life treatment required for our primary product, which is electricity. As per the laws of thermodynamics, energy changes form or is transferred, i.e., electricity powers a light bulb and the energy changes form to radiant energy (light).

## Downstream leased assets

### Evaluation status

Not relevant, explanation provided

### Metric tonnes CO2e

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

### Please explain

TransAlta does not lease any assets downstream of its business, hence this is not relevant.

## Franchises

### Evaluation status

Not relevant, explanation provided

### Metric tonnes CO2e

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

### Please explain

TransAlta has no franchises, hence this is not relevant.

**Investments**

**Evaluation status**

Relevant, calculated

**Metric tonnes CO2e**

4032715

**Emissions calculation methodology**

Technology Innovation and Emissions Reduction (TIER) Regulation - Alberta GHG regulations

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

69

**Please explain**

GHG emissions from sites that we have a financial or equity ownership percentage but are not the operator.

**Other (upstream)**

**Evaluation status**

**Metric tonnes CO2e**

<Not Applicable>

**Emissions calculation methodology**

<Not Applicable>

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

<Not Applicable>

**Please explain**

**Other (downstream)**

**Evaluation status**

**Metric tonnes CO2e**

<Not Applicable>

**Emissions calculation methodology**

<Not Applicable>

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

<Not Applicable>

**Please explain**

C6.7

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(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?

No

C6.10

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**(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.**

**Intensity figure**

0.0078

**Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)**

16379890

**Metric denominator**

unit total revenue

**Metric denominator: Unit total**

2101000000

**Scope 2 figure used**

Location-based

**% change from previous year**

11

**Direction of change**

Decreased

**Reason for change**

GHG emissions reduced in 2020, primarily as a result of significant GHG reductions from increased co-firing of gas in our Alberta Sundance coal facility and decreased coal generation. We retired one of our two US coal units in 2020. Revenues in 2020 were \$2,101 million, down \$246 million compared to 2019, as we saw lower demand and power prices across North America. This was partially offset by a full year of production from the Big Level and Antrim facilities in the Wind and Solar segment and the acquisition of the Ada facility during the year in the North American Gas segment.

**Intensity figure**

0.68

**Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)**

16379890

**Metric denominator**

megawatt hour generated (MWh)

**Metric denominator: Unit total**

24215708

**Scope 2 figure used**

Location-based

**% change from previous year**

10

**Direction of change**

Decreased

**Reason for change**

GHG emissions reduced in 2020, primarily as a result of significant GHG reductions from increased co-firing of gas in our Alberta Sundance coal facility. Overall production across our fleet was lower in 2020, primarily as a result of reduced coal use. We retired one of our two US coal units in 2020.

**C7. Emissions breakdowns**

**C7.1**

**(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?**

Yes

**C7.1a**

**(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).**

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	16162280	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	36138	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	79791	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	114	IPCC Fourth Assessment Report (AR4 - 100 year)

**C-EU7.1b**

**(C-EU7.1b) Break down your total gross global Scope 1 emissions from electric utilities value chain activities by greenhouse gas type.**

	Gross Scope 1 CO2 emissions (metric tons CO2)	Gross Scope 1 methane emissions (metric tons CH4)	Gross Scope 1 SF6 emissions (metric tons SF6)	Total gross Scope 1 emissions (metric tons CO2e)	Comment
Fugitives	421.94	9502.43	113.86	10038.23	This is associated with fugitive emissions from mining related activities and SF6. N2O emission were 0.
Combustion (Electric utilities)	16130027.19	26600.37	0	16236217.91	This is associated with coal and gas combustion. N2O emissions were 79,590.35 tonnes CO2e.
Combustion (Gas utilities)	0	0	0	0	
Combustion (Other)	31830.56	35.69	0	32067.35	This is associated with vehicle GHG emissions. N2O emissions were 201.11 tonnes CO2e.
Emissions not elsewhere classified	0	0	0	0	

**C7.2**

**(C7.2) Break down your total gross global Scope 1 emissions by country/region.**

Country/Region	Scope 1 emissions (metric tons CO2e)
Australia	1074211
Canada	9322861
United States of America	5881252

**C7.3**

**(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.**

By business division

By activity

**C7.3a**

**(C7.3a) Break down your total gross global Scope 1 emissions by business division.**

Business division	Scope 1 emissions (metric ton CO2e)
Coal power generation and mining	13683513
Natural Gas power generation	2593522
Hydro power generation	666
Wind and solar power generation	623
Corporate	0

**C7.3c**

**(C7.3c) Break down your total gross global Scope 1 emissions by business activity.**

Activity	Scope 1 emissions (metric tons CO2e)
Coal-fired Power plants	13642918
Natural gas fired power plants	2593300
Coal mining - operations, surface and handling, mining vehicles	36953
Fleet vehicles	4943
Breakers - fugitive emissions (SF6)	120
Other - Renewable Energy	90

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

**(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.**

	Gross Scope 1 emissions, metric tons CO2e	Net Scope 1 emissions , metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility activities	16241370	<Not Applicable>	The remaining scope 1 emissions or 36,864 tonnes CO2e come from our coal mine, which sits adjacent to our Sundance and Keephills coal generating facilities. The mine is used to produce coal for our electric utilities business; hence we could include this in our 16,278,234 tonnes CO2e total.
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (midstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

**C7.9**

**(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?**  
 Decreased

**C7.9a**

**(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.**

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption		<Not Applicable >		
Other emissions reduction activities	4221226	Decreased	20.5	GHG reductions were down primarily due to reduced GHG emissions from our coal fleet (-4.3 million tonnes CO2e). We have transition plans in place for all of our coal facilities and will be off coal in Canada by the end of 2021 and retire our single US coal unit by 2025. We will have retired 82% of our existing coal fleet by 2021 and will retire the remaining 18% by 2025.
Divestment		<Not Applicable >		
Acquisitions		<Not Applicable >		
Mergers		<Not Applicable >		
Change in output		<Not Applicable >		
Change in methodology		<Not Applicable >		
Change in boundary		<Not Applicable >		
Change in physical operating conditions		<Not Applicable >		
Unidentified		<Not Applicable >		
Other		<Not Applicable >		

**C7.9b**

**(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?**

Location-based

**C8. Energy**

**C8.1**

**(C8.1) What percentage of your total operational spend in the reporting year was on energy?**

More than 30% but less than or equal to 35%

**C8.2**

**(C8.2) Select which energy-related activities your organization has undertaken.**

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	Yes
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

**C8.2a**

**(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.**

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	0	77319067	77319067
Consumption of purchased or acquired electricity	<Not Applicable>	750	187624	188373
Consumption of purchased or acquired heat	<Not Applicable>	0	0	0
Consumption of purchased or acquired steam	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	750	77506691	77507440

**C8.2b**

**(C8.2b) Select the applications of your organization's consumption of fuel.**

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	No
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	Yes

**C8.2c**

**(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.**

**Fuels (excluding feedstocks)**

Subbituminous Coal

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

54032410

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

<Not Applicable>

**MWh fuel consumed for self-generation of cooling**

<Not Applicable>

**MWh fuel consumed for self-cogeneration or self-trigeneration**

0

**Emission factor**

2.06

**Unit**

metric tons CO2e per metric ton

**Emissions factor source**

Calculated based on GHG emissions from scope 1 coal combustion (not factoring in vehicle fuel GHG) divided by coal use (on a ton basis). Calculation follows: 13,646,554 metric tons CO2e / 6,637,068 metric tons coal = 2.06. Coal emission factors vary from location to location. For CO2 at our Alberta coal facilities, we use laboratory tested results of the carbon content in our coal and ash, from three different labs, to average an emission factor for CO2. In this case to calculate CO2 we use the assumed CO2 to C ratio of 3.66417 multiplied by the total carbon in coal minus any carbon in the ash. For CH4 and N2O we use US Environmental Protection Agency (EPA) guidance: USEPA AP 42, Chapter 1.1 (Table 1.1-19. EMISSION FACTORS FOR CH4, TNMOC, AND N2O FROM BITUMINOUS AND SUBBITUMINOUS COAL COMBUSTION). US EPA emission factors are used for coal combustion at our Washington State coal facility.

**Comment**

**Fuels (excluding feedstocks)**

Natural Gas

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

23081721

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

<Not Applicable>

**MWh fuel consumed for self-generation of cooling**

<Not Applicable>

**MWh fuel consumed for self-cogeneration or self-trigeneration**

0

**Emission factor**

0.05178

**Unit**

metric tons CO2 per GJ

**Emissions factor source**

Emission factor source: Canada's GHG Inventory 1990-2018 (Part 2) Table A6.1-1 CO2 Emission Factors for Natural Gas --> assumes 99.5 combustion efficiency -- released 2020

**Comment**

We use a number of emission factors for natural gas. Emission factor use is dependent on geographic location, operations, or regulations in place. For example, at Alberta coal, where we co-fire coal and natural gas, for stationary combustion of natural gas in boilers we use the following emission factor for CO2 tonnes/GJ: 0.050576750. Source: USEPA AP-42 Chapter 1.4 (TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION). In Canada, at our natural gas power generation facilities for stationary combustion of natural gas in boilers we use the following emission factors, source noted above: Electric Utility Natural Gas Combustion - CO2: 0.05178619 tonnes CO2/GJ; Electric Utility Natural Gas Combustion - CH4: 0.00001316 tonnes CH4/GJ; Electric Utility Natural Gas Combustion - N2O: 0.00000132 tonnes N2O/GJ. In Australia, as per National Greenhouse and Energy Reporting regulations, the emission factor for natural gas combustion in boilers is 51.53 kgCO2e/GJ. For use in buildings for heating purposes we apply the Canadian electric utility natural gas combustion factors noted above.

---

**Fuels (excluding feedstocks)**

Diesel

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

194186

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

<Not Applicable>

**MWh fuel consumed for self-generation of cooling**

<Not Applicable>

**MWh fuel consumed for self-cogeneration or self-trigeneration**

0

**Emission factor**

0.00268

**Unit**

metric tons CO2 per liter

**Emissions factor source**

Canada's GHG Inventory 1990-2018 (Part 2) Table A6.1-13: Emission Factors for Energy Mobile Combustion Sources) -- released 2020

**Comment**

Actual emission factor: 0.00268100 tonnes / L (does not fit in box above). The emission factor above is used for mobile diesel combustion across our Canadian operations. Diesel use at Highvale mine represents the majority of our diesel use, totalling 9,631,738 litres or 54 per cent of our diesel combustion and Canadian mobile diesel use represents 55 per cent of diesel combustion. In 2020 our diesel combustion totalled 17,930,478 litres.

---

**Fuels (excluding feedstocks)**

Motor Gasoline

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

8884

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

<Not Applicable>

**MWh fuel consumed for self-generation of cooling**

<Not Applicable>

**MWh fuel consumed for self-cogeneration or self-trigeneration**

0

**Emission factor**

0.0023

**Unit**

metric tons CO2 per liter

**Emissions factor source**

Canada's GHG Inventory 1990-2018 (Part 2) Table A6.1-13: Emission Factors for Energy Mobile Combustion Sources --> applicable to heavy duty vehicles and light duty trucks -- released 2020

**Comment**

Actual emission factor: 0.000230700 tonnes / L. This will not fit in the emission factor box above. CH4 and N2O are 0.00000020 and 0.00000049 tonnes / L respectively

---

**Fuels (excluding feedstocks)**

Propane Gas

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

1373

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

&lt;Not Applicable&gt;

**MWh fuel consumed for self-generation of cooling**

&lt;Not Applicable&gt;

**MWh fuel consumed for self-cogeneration or self-trigeneration**

0

**Emission factor**

0.00151

**Unit**

metric tons CO2e per liter

**Emissions factor source**

Canada's GHG Inventory 1990-2018 (Part 2) Table A6.1-13: Emission Factors for Energy Mobile Combustion Sources--> Propane vehicles (i.e. - forklifts) -- released 2020

**Comment**

Across our operations propane is used for both space heating at remote locations and for operational vehicle use. Emission factors are similar for both uses for CO2, but there is some variance for CH4 and N2O. Stationary Combustion Source - Space Heater Propane - CO2: 0.00151500 tonnes/L Mobile Combustion Source - Propane (light & heavy duty) - CO2: 0.00151500 tonnes/L Stationary Combustion Source - Space Heater Propane - CH4: 0.00000024 tonnes L Mobile Combustion Source - Propane (light & heavy duty) - CH4: 0.00000024 tonnes/L Stationary Combustion Source - Space Heater Propane - N2O: 0.00000108 tonnes/L Mobile Combustion Source - Propane (light & heavy duty) - N2O: 0.00000003 tonnes/L

---

**Fuels (excluding feedstocks)**

Kerosene

**Heating value**

HHV (higher heating value)

**Total fuel MWh consumed by the organization**

492

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

&lt;Not Applicable&gt;

**MWh fuel consumed for self-generation of cooling**

&lt;Not Applicable&gt;

**MWh fuel consumed for self-cogeneration or self-trigeneration**

0

**Emission factor**

0.00256

**Unit**

metric tons CO2 per liter

**Emissions factor source**

Canada's GHG Inventory 1990-2018 (Part 2) Table A6.1-4 Emission Factors for Refined Petroleum Products --> applicable to kerosene -- released 2020

**Comment**

## C-EU8.2d

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(C-EU8.2d) For your electric utility activities, provide a breakdown of your total power plant capacity, generation, and related emissions during the reporting year by source.

### Coal – hard

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

### Lignite

Nameplate capacity (MW)

3806

Gross electricity generation (GWh)

13646

Net electricity generation (GWh)

13646

Absolute scope 1 emissions (metric tons CO2e)

13683513

Scope 1 emissions intensity (metric tons CO2e per GWh)

1002.76

Comment

This is subbituminous coal, as noted above in 8.2c

### Oil

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

### Gas

Nameplate capacity (MW)

1297

Gross electricity generation (GWh)

4130

Net electricity generation (GWh)

4130

Absolute scope 1 emissions (metric tons CO2e)

2593522

Scope 1 emissions intensity (metric tons CO2e per GWh)

627.95

Comment

**Biomass**

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

**Waste (non-biomass)**

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

**Nuclear**

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

**Fossil-fuel plants fitted with CCS**

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

**Geothermal**

Nameplate capacity (MW)

0

Gross electricity generation (GWh)

0

Net electricity generation (GWh)

0

Absolute scope 1 emissions (metric tons CO2e)

0

Scope 1 emissions intensity (metric tons CO2e per GWh)

0

Comment

**Hydropower**

**Nameplate capacity (MW)**

948

**Gross electricity generation (GWh)**

2216

**Net electricity generation (GWh)**

2216

**Absolute scope 1 emissions (metric tons CO2e)**

666

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0.3

**Comment**

**Wind**

**Nameplate capacity (MW)**

1694

**Gross electricity generation (GWh)**

4197

**Net electricity generation (GWh)**

4197

**Absolute scope 1 emissions (metric tons CO2e)**

623

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0.14

**Comment**

**Solar**

**Nameplate capacity (MW)**

21

**Gross electricity generation (GWh)**

26

**Net electricity generation (GWh)**

26

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Marine**

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Other renewable**

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Other non-renewable**

**Nameplate capacity (MW)**

0

**Gross electricity generation (GWh)**

0

**Net electricity generation (GWh)**

0

**Absolute scope 1 emissions (metric tons CO2e)**

0

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

0

**Comment**

**Total**

**Nameplate capacity (MW)**

7766

**Gross electricity generation (GWh)**

24216

**Net electricity generation (GWh)**

24216

**Absolute scope 1 emissions (metric tons CO2e)**

16278323

**Scope 1 emissions intensity (metric tons CO2e per GWh)**

672.22

**Comment**

As per an operational control boundary

**C-EU8.4**

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**(C-EU8.4) Does your electric utility organization have a transmission and distribution business?**

No

**C9. Additional metrics**

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**C9.1**

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**(C9.1) Provide any additional climate-related metrics relevant to your business.**

**Description**

Energy usage

**Metric value**

279026562

**Metric numerator**

GJ

**Metric denominator (intensity metric only)**

**% change from previous year**

19

**Direction of change**

Decreased

**Please explain**

The decrease is attributable to continued reduction of coal use. Since 2015 we have reduced coal use by 53 per cent.

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**C-EU9.5a**

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**(C-EU9.5a) Break down, by source, your total planned CAPEX in your current CAPEX plan for power generation.**

Primary power generation source	CAPEX planned for power generation from this source	Percentage of total CAPEX planned for power generation	End year of CAPEX plan	Comment
Coal – hard	114000000	7	2024	This total includes routine capital, planned major maintenance capital, mine capital, and productivity capital (collectively sustaining and productivity capital expenditures). Outside of ongoing sustaining and productivity capital expenditures we have no growth-related expenditures for coal, rather we have plans to convert coal facilities to gas or retire units. Growth capital expenditures for coal to gas are captured in gas.
Gas	1094000000	68	2024	Approximately 90 per cent of this cost is associated with our coal to gas conversions in Alberta. It also includes the potential for one plant repowering in Alberta and steam turbine upgrades for a customer in Australia. It also includes sustaining and productivity capital expenditures.
Wind	337000000	21	2022	This includes two wind development projects, solar systems with battery support, and sustaining and productivity capital expenditures. Development capital expenditures account for approximately 96 per cent of this total.
Hydropower	39000000	2	2022	Costs are associated primarily with sustaining and productivity capital expenditures.

**C-EU9.5b**

**(C-EU9.5b) Break down your total planned CAPEX in your current CAPEX plan for products and services (e.g. smart grids, digitalization, etc.).**

Products and services	Description of product/service	CAPEX planned for product/service	Percentage of total CAPEX planned products and services	End of year CAPEX plan
Distributed generation	On-site solar with battery support	23000000	1	2022

**C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6**

**(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?**

Investment in low-carbon R&D	Comment
Row 1 Yes	This activity has fluctuated over time due to cash flow availability, market demands, and capacity of innovation potential. In 2020 we invested in a 10 MW/20 MWh utility-scale storage project in southern Alberta at our Summerview wind farm. This was the first of its kind in Alberta. We continue to explore battery storage opportunities. An 18.5 MW solar photovoltaic farm at Nickel West's Leinster and Mount Keith operations in Australia that will be supported by a battery energy storage system is currently underway. As an electricity generator, we also continually and consistently look for ways to optimize and create efficiencies related to the use of energy. For example, TransAlta has engaged with Pacific Northwest National Laboratory (PNNL) to conduct a feasibility study to assess how storage and hybrid systems can be utilized to help meet the energy needs of the Pacific Northwest region of the US as it undergoes a significant energy transition to clean energy. In addition, we continue to engage with various developers of long duration energy storage solutions, such as flow batteries. This technology will allow for time shifting energy from week to week and potentially season to season.

**C-CO9.6a/C-EU9.6a/C-OG9.6a**

**(C-CO9.6a/C-EU9.6a/C-OG9.6a) Provide details of your organization's investments in low-carbon R&D for your sector activities over the last three years.**

Technology area	Stage of development in the reporting year	Average % of total R&D investment over the last 3 years	R&D investment figure in the reporting year (optional)	Comment
Energy storage	Applied research and development	81-100%	1	This is our 10 MW/20 MWh utility-scale storage project in southern Alberta at our Summerview wind farm, as well as investigation into battery technologies, feasibility studies and other initiatives.

**C10. Verification**

**C10.1**

**(C10.1) Indicate the verification/assurance status that applies to your reported emissions.**

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	No third-party verification or assurance

**C10.1a**

**(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.**

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

TAC2020\_AnnualReport\_March12.pdf  
Sustainability Assurance Statement.pdf

**Page/ section reference**

Page 257 of our Annual Integrated Report. We have also posted the Assurance Statement for ease of access.

**Relevant standard**

ASAE3000

**Proportion of reported emissions verified (%)**

100

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**C10.1b**

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**(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.**

**Scope 2 approach**

Scope 2 location-based

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

TAC2020\_AnnualReport\_March12.pdf  
Sustainability Assurance Statement.pdf

**Page/ section reference**

Page 257 of our Annual Integrated Report. We have also posted the Assurance Statement for ease of access.

**Relevant standard**

ASAE3000

**Proportion of reported emissions verified (%)**

100

---

**C10.2**

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**(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?**

Yes

**C10.2a**

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**(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?**

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C6. Emissions data	Year on year change in emissions (Scope 1)	International Standard on Assurance Engagements 3000 "Assurance Engagements other than Audits or Reviews of Historical Financial Information"	Included in our annual sustainability assurance with EY Sustainability Assurance Statement.pdf
C6. Emissions data	Year on year change in emissions (Scope 2)	International Standard on Assurance Engagements 3000 "Assurance Engagements other than Audits or Reviews of Historical Financial Information"	Included in our annual sustainability assurance with EY Sustainability Assurance Statement.pdf
C6. Emissions data	Year on year change in emissions (Scope 1 and 2)	International Standard on Assurance Engagements 3000 "Assurance Engagements other than Audits or Reviews of Historical Financial Information"	Included in our annual sustainability assurance with EY Sustainability Assurance Statement.pdf
C6. Emissions data	Year on year emissions intensity figure	International Standard on Assurance Engagements 3000 "Assurance Engagements other than Audits or Reviews of Historical Financial Information"	Included in our annual sustainability assurance with EY Sustainability Assurance Statement.pdf

**C11. Carbon pricing**

**C11.1**

**(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?**

Yes

**C11.1a**

**(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.**

Alberta Carbon Competitive Incentive Regulation (CCIR) – ETS  
 Canada federal fuel charge  
 Canada federal Output Based Pricing System (OBPS) - ETS  
 Washington CAR

**C11.1b**

**(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.**

**Alberta Carbon Competitive Incentive Regulation (CCIR) – ETS**

**% of Scope 1 emissions covered by the ETS**  
 51

**% of Scope 2 emissions covered by the ETS**  
 0

**Period start date**  
 January 1 2020

**Period end date**  
 December 31 2020

**Allowances allocated**  
 0

**Allowances purchased**  
 0

**Verified Scope 1 emissions in metric tons CO2e**  
 8268797

**Verified Scope 2 emissions in metric tons CO2e**  
 0

**Details of ownership**  
 Facilities we own and operate

**Comment**

#### Canada federal OBPS - ETS

**% of Scope 1 emissions covered by the ETS**

6

**% of Scope 2 emissions covered by the ETS**

0

**Period start date**

January 1 2020

**Period end date**

December 31 2020

**Allowances allocated**

0

**Allowances purchased**

0

**Verified Scope 1 emissions in metric tons CO2e**

1016595

**Verified Scope 2 emissions in metric tons CO2e**

0

**Details of ownership**

Facilities we own and operate

**Comment**

Ontario large emitters were subject to the federal backstop OBPS regulation in 2020

#### Washington CAR

**% of Scope 1 emissions covered by the ETS**

36

**% of Scope 2 emissions covered by the ETS**

0

**Period start date**

January 1 2020

**Period end date**

December 31 2020

**Allowances allocated**

0

**Allowances purchased**

0

**Verified Scope 1 emissions in metric tons CO2e**

5845170

**Verified Scope 2 emissions in metric tons CO2e**

0

**Details of ownership**

Facilities we own and operate

**Comment**

Although the Clean Air Rule is currently suspended, facilities covered by the Clean Air Rule still are required to report their emissions for the Greenhouse Gas Reporting program. This reporting program is required by Washington law. We verify all Centralia scope 1 emissions (and scope 2) annually through our corporate sustainability function, utilizing EY to conduct the third-party assurance.

#### C11.1c

(C11.1c) Complete the following table for each of the tax systems you are regulated by.

##### Canada federal fuel charge

**Period start date**

January 1 2020

**Period end date**

December 31 2020

**% of total Scope 1 emissions covered by tax**

0.01

**Total cost of tax paid**

2712.71

**Comment**

Our emissions that were regulated under the Canada federal fuel charge included 0.23 tonnes CO2e for our Alberta wind operations for which we paid \$6.11 and 90.33 tonnes of CO2e for our Alberta hydro operations for which we paid \$2,706.60.

C11.1d

---

**(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?**

Our strategy is to participate in carbon pricing markets from both a design/process/continuous improvement standpoint and also strategically, for the purpose of either lowering compliance costs (i.e., optimize facilities) or to generate revenue (i.e., offsets, trading).

TransAlta has employment positions dedicated to managing and complying with all the carbon programs in our operating jurisdictions. The individuals work to ensure we respect the prerequisite and compliance rules of each market and comment and participate in the implementation of new markets and/or new instruments. From the trader to the compliance analyst, to the emission engineer we make sure that TransAlta has the knowledge to understand these different carbon programs. Our contributions to policy design of the Carbon Competitiveness Incentive Regulation (CCIR) and Technology Innovation and Emission Reduction (TIER) in Alberta helped secure opt in for origination of carbon offset credits from our hydro and a number of wind facilities in the province. Carbon offsets currently track the carbon price in Alberta which was \$30/tonne in 2020 and we expect to generate additional revenue as the Alberta carbon price escalates as forecasted, significantly adding value to our renewable facilities and to shareholders.

C11.2

---

**(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?**

Yes

C11.2a

---

**(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.**

**Credit origination or credit purchase**

Credit purchase

**Project type**

Agriculture

**Project identification**

CALS5021-F

**Verified to which standard**

CAR (The Climate Action Reserve)

**Number of credits (metric tonnes CO2e)**

2531

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

2531

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit purchase

**Project type**

Forests

**Project identification**

CAFR5305-A

**Verified to which standard**

CAR (The Climate Action Reserve)

**Number of credits (metric tonnes CO2e)**

4000

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

4000

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit purchase

**Project type**

Forests

**Project identification**

---

CAFR5315-A

**Verified to which standard**

CAR (The Climate Action Reserve)

**Number of credits (metric tonnes CO2e)**

13994

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

13994

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

HFCs

**Project identification**

CAOD6326-A

**Verified to which standard**

CAR (The Climate Action Reserve)

**Number of credits (metric tonnes CO2e)**

5000

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

5000

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit purchase

**Project type**

Agriculture

**Project identification**

1991-0013

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

50000

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

50000

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit purchase

**Project type**

Other, please specify (Emission Performance Credits)

**Project identification**

4362

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

5484

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

5484

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit purchase

**Project type**

Other, please specify (Emission Performance Credits)

**Project identification**

1G25

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

8533

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

8533

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit purchase

**Project type**

Landfill gas

**Project identification**

3754-3212

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

6106

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

6106

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit purchase

**Project type**

Methane avoidance

**Project identification**

3121-2397

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

41926

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

41926

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit purchase

**Project type**

Methane avoidance

**Project identification**

2972-6773

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

6292

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

6292

---

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit purchase

**Project type**

Methane avoidance

**Project identification**

3215-1606

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

11782

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

11782

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit purchase

**Project type**

Agriculture

**Project identification**

4773-4563

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

25000

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

25000

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit purchase

**Project type**

Wind

**Project identification**

4852-9626

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

90000

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

90000

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

Wind

**Project identification**

7635-3949

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

---

**Number of credits (metric tonnes CO2e)**

4438

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

4438

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

Wind

**Project identification**

3863-7255

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

116364

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

116364

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

Wind

**Project identification**

4125-3966

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

2068

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

2068

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

Wind

**Project identification**

6384-3449

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

20367

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

20367

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit purchase

**Project type**

Other, please specify (Permit to pollute that California releases under their cap-and-trade program )

---

**Project identification**

CCA

**Verified to which standard**

Other, please specify (Permit to pollute that California releases under their cap-and-trade program )

**Number of credits (metric tonnes CO2e)**

70196

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

70196

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

Wind

**Project identification**

Alberta Wind Offset

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

385412

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

385412

**Credits cancelled**

No

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

Wind

**Project identification**

Alberta Wind EPC

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

85842

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

85842

**Credits cancelled**

No

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

Hydro

**Project identification**

Alberta Hydro EPC

**Verified to which standard**

Other, please specify (Alberta Carbon Registries)

**Number of credits (metric tonnes CO2e)**

694050

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

694050

**Credits cancelled**

No

**Purpose, e.g. compliance**

Compliance

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## C11.3

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### (C11.3) Does your organization use an internal price on carbon?

Yes

## C11.3a

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### (C11.3a) Provide details of how your organization uses an internal price on carbon.

#### Objective for implementing an internal carbon price

Navigate GHG regulations  
Stakeholder expectations  
Drive low-carbon investment  
Stress test investments  
Identify and seize low-carbon opportunities

#### GHG Scope

Scope 1  
Scope 2

#### Application

• Where a jurisdiction has a clear carbon regulatory framework or policy plan, we use that as the planning tool e.g. TIER in Alberta where we paid \$30/tonne in 2020 • In Canada, we model carbon price estimates at approximately \$30/tonne for facilities where we have obligations potentially rising to \$170 by 2030 as per federal guidance • In jurisdictions without carbon pricing we apply scenario analysis to an effective carbon price to guide decisions; in many cases we have built in contract protection through flow of carbon pricing to the customer • We do not always include offset generating potential modelling in budget calculations. The primary driver for wind development is electrical generation. Jurisdictions where attractive offset potential exists, such as when we do produce offset credits at the prevailing carbon price from many of our Alberta renewable facilities, it is taken into consideration along with a number of other factors (e.g., stability of the offset market).

#### Actual price(s) used (Currency /metric ton)

30

#### Variance of price(s) used

Approximately 70 per cent

#### Type of internal carbon price

Shadow price  
Offsets

#### Impact & implication

Our coal-to-gas transition in Alberta has been influenced by carbon pricing and other factors, which include electricity prices, industry trends towards cleaner power solutions, customer preference towards green products, and external market forces. Carbon costs to run coal in an Alberta \$40/tonne carbon price environment are approximately \$30/MWh. This would increase in 2022 as carbon prices are expected to rise to \$50/tonne, in line with Canadian federal guidance. Conversion of coal units to gas significantly reduces carbon costs/MWh. In a modelled \$40 carbon price environment, carbon costs are approximately \$10/MWh for coal facilities converted to gas through boiler conversions. For coal facilities repowered to gas, emission costs are close to zero in Alberta. Analysis is based on a sub-critical unit, \$40 per tonne carbon price, and 0.37 tonne CO<sub>2</sub>e /MWh performance standard. Emission costs include carbon and, in the case of coal, mercury, NO<sub>x</sub> and SO<sub>x</sub>. Analysis will vary depending on heat rate and capacity factors.

## C12. Engagement

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## C12.1

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### (C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers  
Yes, our customers  
Yes, other partners in the value chain

## C12.1a

---

**(C12.1a) Provide details of your climate-related supplier engagement strategy.**

**Type of engagement**

Other, please specify (Code of Conduct in place for all suppliers, which communicates TA sustainability values: commitment to health & safety, labour issues and human rights, environmental leadership, stakeholders and society, and ethical business conduct.)

**Details of engagement**

Please select

**% of suppliers by number**

100

**% total procurement spend (direct and indirect)**

75

**% of supplier-related Scope 3 emissions as reported in C6.5**

100

**Rationale for the coverage of your engagement**

Our scope includes direct procurement of goods and services, which we have the ability to engage with and ensure sign off on the conduct. We could not confirm the percentage of total procurement spend, but we do know that the majority of our supply spend is direct. As such, 75 per cent is a conservative estimate.

**Impact of engagement, including measures of success**

We have sent this to all suppliers and are also now beginning to include this information within our PO Terms & Conditions.

**Comment**

Suppliers are to provide acknowledgement of this Code as a condition of engagement. It is also expected that Suppliers will comply with all laws, rules, and regulations applicable to TransAlta's business in the countries in which it operates.

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**C12.1b**

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**(C12.1b) Give details of your climate-related engagement strategy with your customers.**

**Type of engagement**

Collaboration & innovation

**Details of engagement**

Other, please specify (On-site cogeneration)

**% of customers by number**

3

**% of customer - related Scope 3 emissions as reported in C6.5**

15

**Portfolio coverage (total or outstanding)**

<Not Applicable>

**Please explain the rationale for selecting this group of customers and scope of engagement**

TransAlta has expertise in on-site cogeneration development for customers and, if required, operations of on-site cogeneration. A number of industrial processes can benefit from the use of high efficiency steam to replace existing natural gas boilers. Examples of industrial processes that utilize cogeneration include gas processing, steam-assisted gravity drainage oil sands extraction, chemical manufacturing, and pulp and paper production. When constructed on-site, the construction of additional transmission lines is not required, which avoids disruption to the environment. It also reduces the natural gas required for some industrial processes by using high efficiency steam production rather than boilers. Cogeneration is recognized by regulatory bodies for its efficiency in generating power versus traditional methods, and thus can potentially produce Emission Performance Credits (in Alberta) that can be used to satisfy our customers' regulatory obligations or sold as additional revenue.

**Impact of engagement, including measures of success**

Each project is specific and there are several metrics we could analyze, but one example is the energy savings for the steam produced from cogeneration versus traditional methods. In Canada in 2020, TransAlta required an average of 1.28 GJ of energy per GJ of steam produced. This is lower in comparison to an estimated average from a study from Yale University of 1.56 GJ/GJ of steam. In 2020 we increased our cogeneration fleet with the purchase of our 29 MW Ada facility in Ada, Michigan.

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**C12.1d**

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**(C12.1d) Give details of your climate-related engagement strategy with other partners in the value chain.**

In 2015, we announced a US \$55 million community investment over 10 years to support energy efficiency, economic and community development, and education and retraining initiatives in Washington State. The US \$55 million community investment is part of the TransAlta Energy Transition Bill, passed in 2011. This bill was a historic agreement between policymakers, environmentalists, labour leaders, and TransAlta to transition away from coal in Washington State, closing the Centralia facility's two units, one in 2020 and the other in 2025.

The US \$55 million community investment was directly sent to the Weatherization Board (\$10M), the Economic & Community Development Board (\$20M) and the Energy Technology Board (\$25M). To date, the Weatherization Board has invested \$7M, the Economic & Community Development Board \$14M, and the Energy Technology Board \$9M. This funding continues to be distributed to the community on annual basis and we participate in project grant approvals.

**C12.3**

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**(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?**

Direct engagement with policy makers  
Trade associations

**C12.3a**

**(C12.3a) On what issues have you been engaging directly with policy makers?**

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Carbon tax	Support	Directly engaged with government, policymakers, industry, and NGOs on new carbon market design for Alberta, which became effective Jan 1, 2020, as the Technology Innovation and Emissions Reduction (TIER) regulation	We supported consultation on the carbon market redesign and advocated for design that would ensure competitiveness, growth, and job creation in Alberta, while succeeding at reducing emissions. A large majority of our Alberta hydro facilities and wind facilities were qualified to generate carbon offset credits under the previous Carbon Competitiveness Incentive Regulation (CCIR), which results in additional revenue for TransAlta at the CCIR per tonne CO <sub>2</sub> e price (currently \$30/tonne in 2020). We advocated that these facilities, which are renewable facilities, continue to be included within the carbon offset component of TIER.
Clean energy generation	Support with minor exceptions	Engaged with government, policymakers, industry, and NGOs on future of clean energy mix	TransAlta core convictions are that the price of renewables will continue declining, the price of battery storage will continue to decline, and demand for clean electricity will increase. We continue to engage policymakers and stakeholders regarding the best way to facilitate a transition where the electricity systems we serve can reach net zero while maintaining competitive costs and reliability. We will continue to invest in renewables and assess the best options to deliver reliability through energy storage, including incorporating learnings from our industrial-scale battery into our corporate strategy and sharing those learnings with government. At the same time, we believe natural gas will play an important role in the electricity sector, providing baseload and peaking generation to support system demands and intermittent renewable generation. TransAlta operates simple and combined cycle units as well as cogeneration facilities in Canada and Australia.

**C12.3b**

**(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?**

Yes

**C12.3c**

**(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.**

**Trade association**

Independent Power Producers Society of Alberta (IPPSA)

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

IPPSA offers a forum for Alberta's power producers to generate policy positions representing the interests of membership with government and stakeholders. IPPSA is a strong proponent of competitive market principles, allowing the market to determine the most appropriate types of energy generation. As Alberta shifts from coal to natural gas and renewable energy, IPPSA advises government on policy changes while representing the interests of its members.

**How have you influenced, or are you attempting to influence their position?**

We are aligned with IPPSA on the need for a transition to a lower carbon grid in Alberta. At TransAlta we support smart carbon pricing policies that support competitiveness, while reducing carbon emissions.

**Trade association**

Canadian Electricity Association (CEA)

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

The CEA advocates for rational climate change policy with the Canadian federal government as it relates to the electricity sector.

**How have you influenced, or are you attempting to influence their position?**

We support this position.

**C12.3f**

**(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?**

Our corporate strategy integrates our climate change strategy; the two go very much hand in hand. Our corporate strategy includes six pillars: conversion of coal fleet to gas or retire units; deliver on announced renewables growth; increase our presence in the US renewables market; advance and expand our on-site generation business; maintain a strong financial position; and in 2020 we have added a new pillar, which is to keep our people protected and resilient under COVID. As such our corporate strategy is tied to significant decarbonization and supporting our customers' goals to decarbonize. Hence, our strategy ensures that our activities support low carbon policy. Employees are expected to represent these corporate positions when engaging with policy makers or trade associations. As previously noted, we support smart carbon pricing that ensures competitiveness for the electricity sector, while reducing carbon emissions. Specific processes and policy in place include our:

- "Transition to Renewable Energy" metric within executive long-term incentive compensation
- GHG reduction target to 2030, which essentially provides a cap on fossil fuel and GHG intensive growth
- Carbon neutrality target for 2050

**C12.4**

**(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).**

**Publication**

In mainstream reports, incorporating the TCFD recommendations

**Status**

Complete

**Attach the document**

TAC2020\_AnnualReport\_March12.pdf

**Page/Section reference**

Please refer to pages M88 to M96

**Content elements**

Governance  
Strategy  
Risks & opportunities  
Emissions figures  
Emission targets

**Comment**

**C15. Signoff**

**C-FI**

**(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.**

Nothing further.

**C15.1**

**(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.**

	<b>Job title</b>	<b>Corresponding job category</b>
Row 1	John Kousiniotis, President, Chief Executive Officer and Corporate Director	Chief Executive Officer (CEO)

**Submit your response**

**In which language are you submitting your response?**

English

**Please confirm how your response should be handled by CDP**

	<b>I am submitting to</b>	<b>Public or Non-Public Submission</b>
I am submitting my response	Investors	Public

**Please confirm below**

I have read and accept the applicable Terms